NAVAL FIGHTERS NUMBER TWENTY TWO

NORTH AMERICAN
AJ-1 *Savage*

BY STEVE GINTER

SAVAGE DATA

MODEL	CONSTRUCTION NUMBER	CONTRACT	DESIGNATION	AMOUNT	BUREAU #s
NA-146	146-38429/431	NOa(s)-8348	XAJ-1	3	121460-462
NA-156	156-38465/476	NOa(s)-9243	AJ-1	12	122590-601
NA-160	160-1/28	NOa(s)-9773	AJ-1	28	124157-184
NA-163	163-1/2	NOa(s)-10092	XA2J-1	2	124439-440
NA-169	169-1/15	NOa(s)-10486	AJ-1	15	124850-864
NA-175	175-1/12	NOa(s)-51-139	AJ-2P	12	128043-054
NA-175	175-13/23	NOa(s)-51-139	AJ-2P	11	129185-191
NA-183	183-1/4	NOa(s)-51-634i	AJ-2P	4	130422-425
NA-183	183-5/7	NOa(s)-51-634i	AJ-2P	3	134073-075
NA-184	184-1/17	NOa(s)-51-634i	AJ-2	17	130405-421
NA-184	184-18/55	NOa(s)-51-634i	AJ-2	38	134035-072

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ISBN 0-942612-22-1

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TAIL CODES

SQUADRONS	TAIL CODES
HATU	AN
VC-5	NB
VC-6	NF
VC-7	NH
VC-8	NC
VC-9	FG
VAH-5	NB
VAH-6	NF/ZC
VAH-7	NH/GL
VAH-9	FG
VAH-11	NC/GN
VAH-15	GP
VAH-16	ZH
VJ-61	PB
VJ-62	TP
VAP-61	PB/SS
VAP-62	TP/GB

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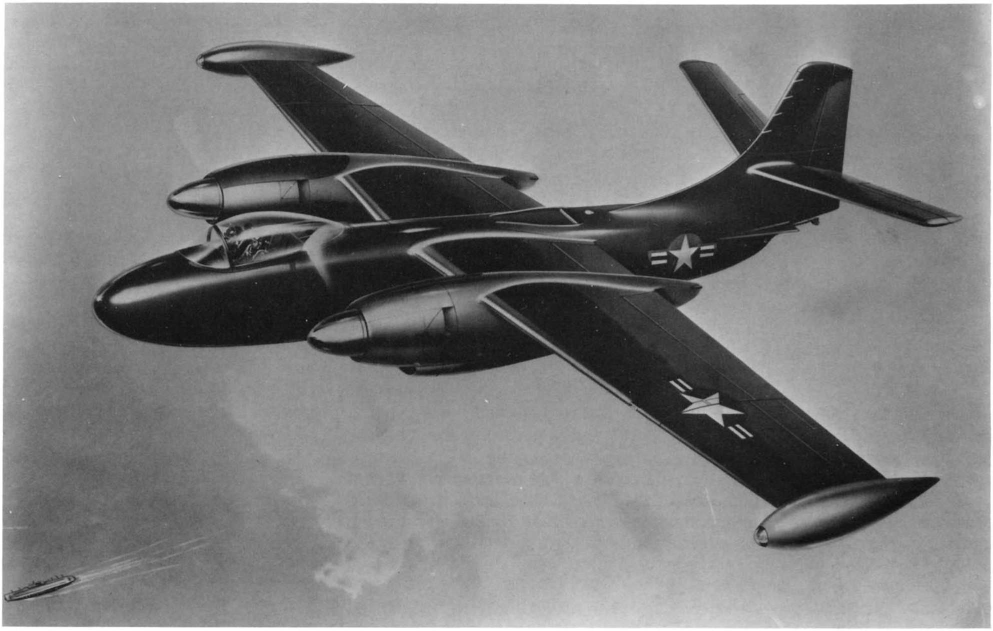
FRONT COVER PHOTO:
The seventeenth production AJ-2 Savage (130421) on a North American test hop prior to the aircrafts acceptance by the Navy. (North American via Steve Pace)

BACK COVER PHOTOS:
Top, XAJ-1 prototype crosses the California Coast. At this point the aircraft had the single piece bubble canopy no tip tanks and no prop spinners. (NAA via Pace)
Bottom, early AJ-2P from VJ-62. (NAA via Pace)

THE NORTH AMERICAN AJ SAVAGE



Manufacturer's drawing of the XAJ-1 on 8-16-48. This rendition makes the Savage appear much sleeker than the finished airframe was. (National Archives)

BACKGROUND

The North American AJ "Savage" came into being as a direct result of the greatest Navy and Government controversy since Billy Mitchell and the Battleships. This controversy was over the future nuclear strike capability of the Navy, if any.

At the end of World War Two the U. S. Army Air Corps controlled the few atomic bombs that existed and had the only means of delivering them, the B-29 Superfortress. In September 1947, the U. S. Air Force was formally established and sought to control the nation's nuclear strike capability totally. With this control the Air Force would assume the role of the primary military force in the United States. The Navy would be nothing more than a logistic support group in support of the Air Force.

The most aggressive stance against the Air Force controlling the nuclear destiny of the nation came from RADM Daniel Gallery, Assistant Chief of Naval Operations (guided missiles), in a report dated 17 December 1947. Interservice rivalry being what it is, ADM Gallery of course believed the Navy could do the job better and outlined why in the "Gallery Memorandum." He argued that the current Air Force nuclear delivery platform, the B-29, lacked the range necessary to strike an overseas enemy from the United States. Furthermore, the long-range B-36 which was replacing the B-29 required fighter escorts which would have to use overseas bases. With these facts in mind, the Admiral proposed a new carrier and a new aircraft dedicated to the nuclear mission. In theory this aircraft would run in on the deck to avoid detection, thus eliminating the need for fighter escorts. What follows is the salient excerpts from his report.

THE ATOMIC CARRIER

"The carrier would transport the bomber across the ocean and launch it 1,000 miles from its target. Instead of building the trans-oceanic range into the bomber, and thereby penalizing its performance over enemy territory, we build the trans-oceanic range into the carrier. We design the airplane for maximum performance on a comparatively short flight.

The importance of an A-Bomb mission is such that we can well afford to expend the airplane that delivers the bomb. But we want to get the crew back. We can do this by stationing submarines at previously designated spots to which the bombers can fly and ditch after delivering the bomb. In this way the carriers are left free to take evasive action as soon as the bomber is launched, making it impossible to follow the bomber back to the carrier.

The governing requirement for an atomic carrier is to provide the best possible take-off platform for the A-bomber. There should be no island; a new type catapult for launching craft is required; arresting gear is of secondary importance; the Air Group will be on the order of a dozen planes; special high speed submarines for rescue purposes are required.

The A-bomber designed for maximum performance for one flight; no landing gear is necessary; take-off will be made from a carriage running along a track on the deck; carriage will be started by catapult or assisted by jato; planes will be designed for ditching; airplane dimensions can be greatly increased over present sizes now used on carriers.

If our A-bomber has a 1,500 nautical miles combat radius it can reach all of Europe and Asia except a few spots in central Siberia. This can be done by launching from carriers on the high seas, excluding the Mediterranean.

The 1,500 mile bomber will obviously have better performance over enemy territory than a trans-oceanic bomber. A 1,500 mile bomber designed under the concept above will always have better performance than a 1,500 mile bomber which is forced to take off from land. The principal reason for this is that the take-off distance has an important effect on design, and we always have 30 knots of wind across the deck. In addition, the elimination of the landing gear gives us about a 5% advantage in weight. So for a plane of the same size, a carrier plane without landing gear can use the 5% savings in gross weight, and thus get either increased range or higher speed.

The major missions of the Navy and Air Force should be as follows:

Navy: The delivery of an atomic attack on the capitol and industrial centers of the enemy. Secondary mission: Control of the seas.

Air Force: The defense of the United States against air attack. Secondary mission: The delivery of atomic attacks from overseas bases."

The debates and inter-service rivalry continued until the spring of 1948 when the Secretary of Defense, James V. Forrestal, conducted a meeting of the Joint Chiefs of Staff to discuss and establish the missions and roles of the services. The guidelines established, known as the Key West Agreement, acknowledged the Air Force's claim to maintain the nation's strategic air arm and to be the primary service to deliver nuclear weapons. The agreement, however, allowed the Navy to develop a nuclear strike capability to be utilized against enemy facilities used for the support of maritime operations. Forrestal pointed out "that had we had the A-bomb in 1942 and a plane capable of delivering it from the USS Hornet, Doolittle's flight over Japan in April of 1942 might have aborted the Japanese war effort." Through this meeting Forrestal gave the Navy the go-ahead it needed for its super carrier.

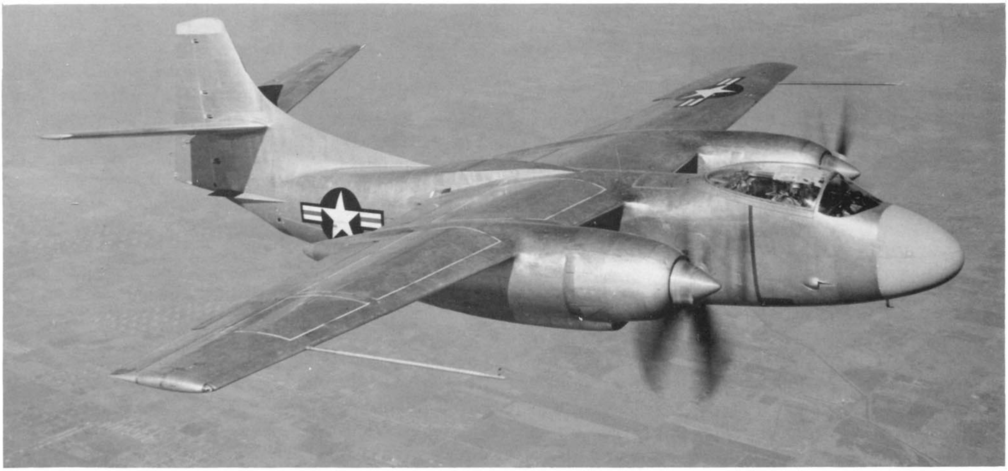
The new carrier, the USS United States (CVA-58) would be the world's largest ship estimated at 65,000 tons. On 18 April 1949 the keel was laid, but on 23 April construction was halted by Secretary of Defense Louis Johnson, who had replaced the ailing Forrestal on 28 March 1949. After taking office Johnson solicited the Joint Chiefs of Staff and Dwight D. Eisenhower, the president's military advisor, for recommendations for the continuation or cancellation of the carrier. Of course the recommendations were no surprise, Army three Navy one. Eisenhower, Omar Bradley and Hoyt Vandenberg contended that the carrier was not needed because it was a duplication of the Air Force's mission. After this input the carrier was summarily cancelled without consultation with ADM Louis Denfeld (CNO) or the Secretary of the Navy John L. Sullivan. The result of the cancellation was the immediate resignation of Secretary Sullivan and a Navy pressured Congressional investigation of the entire B-36 program.

When the dust settled, the Congress upheld the B-36 program and the Navy used the previously appropriated funds for the United States to modernize existing carriers. The Navy, however, did have the "last word" and thus proved its case against the B-36. An unauthorized flight was conducted by a nameless "Banshee" pilot, who took his photo Banshee undetected up under the tail of a B-36 and flew formation for a brief few moments before moving smartly out from under the behemoth and asking it to say cheese. The Navy of course did eventually get its super carrier which was named in respect for James Forrestal. The USS Forrestal (CVA-59) was commissioned on 1 October 1955 and the nuclear bomber, which was built for the cancelled USS United States, would operate from its decks prior to being replaced by the A3D "Skywarrior".

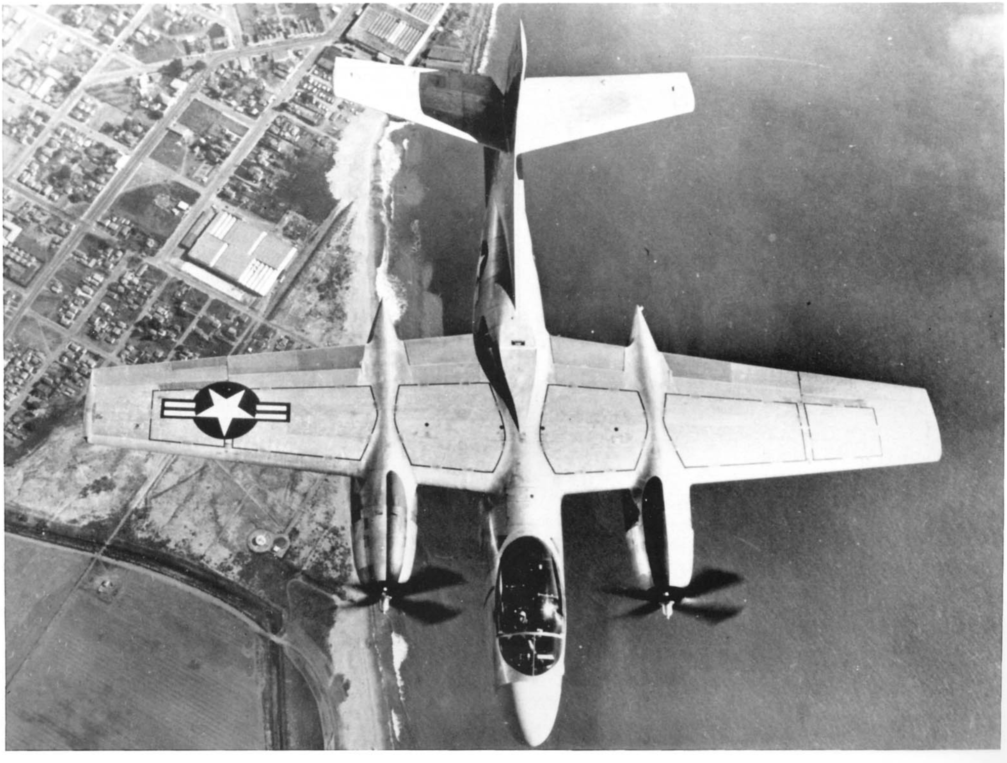
DEVELOPMENT

On 13 August 1945 the Navy opened up a design competition for a carrier-based attack aircraft capable of carrying a 10,000 pound payload. Also late in 1945 a discussion took place between Deputy chief of Naval Operations (Air), VADM Mitscher, CAPT William Parsons (Navy weapons specialist) who had worked on the "Enola Gay", and CDR John Hayward who was involved in rocket development. The discussion took place to establish how the Navy could develop a carrier-based nuclear strike capability. It was noted that the "Fat Man" bomb weighed in at about 10,000 pounds and therefore could be carried by the new proposed attack aircraft. In the meantime North American Aviation won the design competition and the idea was discussed with CDR Fredrick Ashworth (weaponeer for the Nagasaki flight) and CAPT J. N. Murphy who were assigned to the Navy Bureau of Aeronautics. They concurred that the AJ Savage design could be modified to accept the new Mark four atomic bomb and had the design modified to accommodate it.

It would be several years before the Savage would be available to the fleet so the Navy wanted an interim carrier-based nuclear delivery plat-



Natural metal XAJ-1 121460 in flight. Above, with original large prop spinners and twin wing instrument test booms on 8-16-48. (National Archives) Below, with spinners and test booms removed and with black anti-glare panels added to the engine nacelles. (NASM)



form. The only possible aircraft was the new Lockheed P2V Neptune. The Neptune however was so large that it would have to be lifted aboard the large Midway class carriers in port, then "jatoed" off, attack the target and ditch at sea. The Navy ordered twelve specially modified Neptunes for the role, known as P2V-3Cs. These aircraft were tested and utilized to form the nucleus of Composite Squadron Five (VC-5). VC-5's first commanding officer would be CAPT John Hayward who took part in the 1945 initial discussions.

On 24 June 1946 a contract was let to North American for three XAJ-1 prototypes and one static test airframe. On the basis of the mock-up a dozen production AJ-1s were ordered on 6 October 1947. Another 28 AJ-1s were ordered on 20 May 1948 even though the XAJ-1 had not even flown yet.

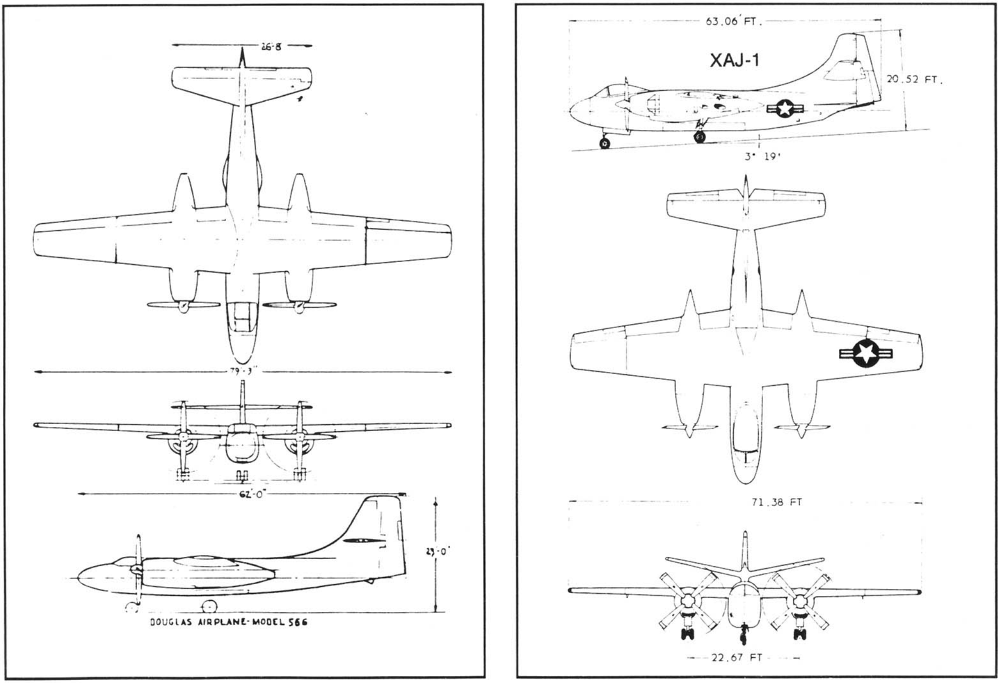
The first XAJ-1 was rolled out in June 1948 and first flown by Bob Chilton on 3 July, with the second XAJ-1 taking to the air in September. The third prototype flew in January 1949 and a very short development program followed with changes being incorporated on the production line with the first production AJ-1 flying in May 1949.

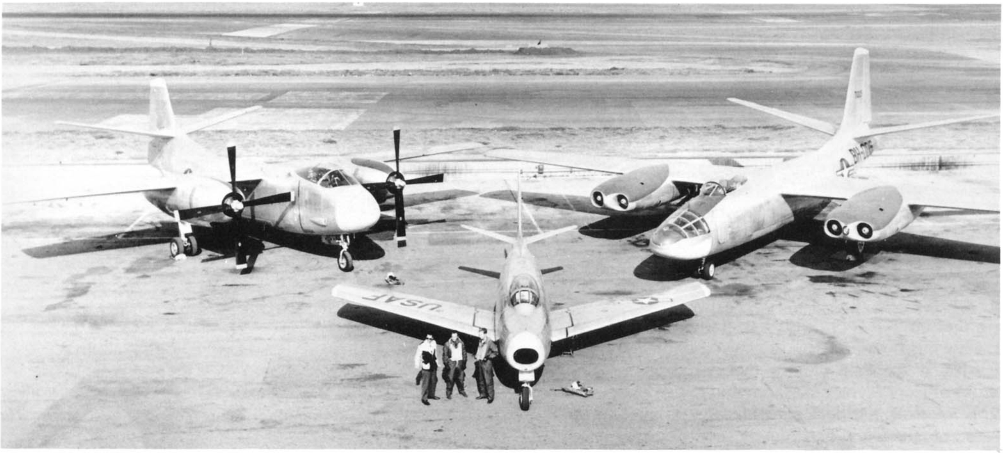
Disaster struck the test program in February 1949 when the number two aircraft (BuNo 121461) lost the entire tail section during a maximum rudder sideslip test. Company test pilots Al Conover and Chuck Brown were lost when the aircraft crashed at sea off the coast of Los Angeles. The number three aircraft (BuNo 121462) was lost at Edwards AFB with no loss of life after a wing failure. The first XAJ-1 (121460) not only survived the test program but ended its days as a nose gear test article for the A-6 Intruder program at Grumman.

THE AIRPLANE, TWO TURNING AND ONE BURNING

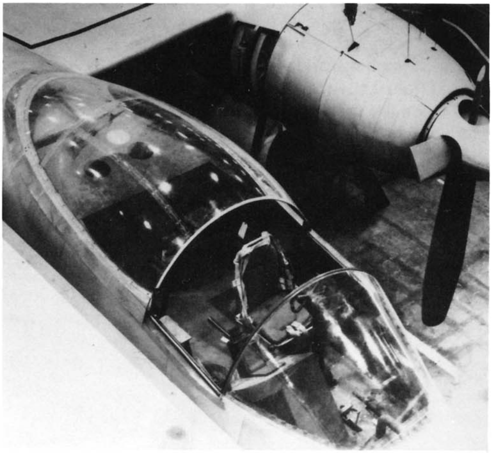
The most notable feature of the Savage was its mixed powerplants of two Pratt and Whitney R-2800-44W Twin Cyclone radials and a single Allison-built General Electric J-33 turbojet. The R-2800s were mounted in large nacelles slung under each wing which housed the main landing gear. The J-33 was fitted in the rear fuselage with the exhaust exiting beneath the tail. When the J-33 was in operation an intake door would open just ahead of the wing's trailing edge in the triangular hump on top of the fuselage. The 4,600 lb. thrust J-33 would only normally be used for take-off, high speed run-in on the deck and during an engine failure. Since both the R-2800s and the J-33 burned high octane Av-gas they were able to utilize fuel from the same tanks.

Below left, drawings of the Douglas proposal and right, the XAJ-1. The drawings show the simularities in the two companies solution to the design requirements.



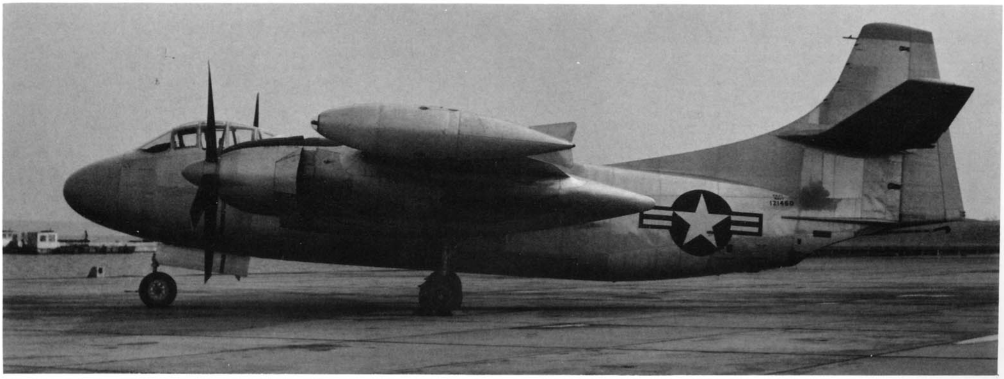


Family photo taken at North American's Inglewood, California, plant shows the XAJ-1 Savage number one (121460), a F-86A Sabre Jet and the fifth B-45 Tornado bomber. (NASM)



Mock-up of the Savage cockpit as seen from above shows the single-piece windscreen and sliding one-piece clamshell used on the XAJ-1 Savages. The mock-up was also equipped with a control wheel which was deleted in favor of a stick in the AJ-1s only to be reinstated in the AJ-2P and AJ-2 Savages. (NAA via Bob Lawson)

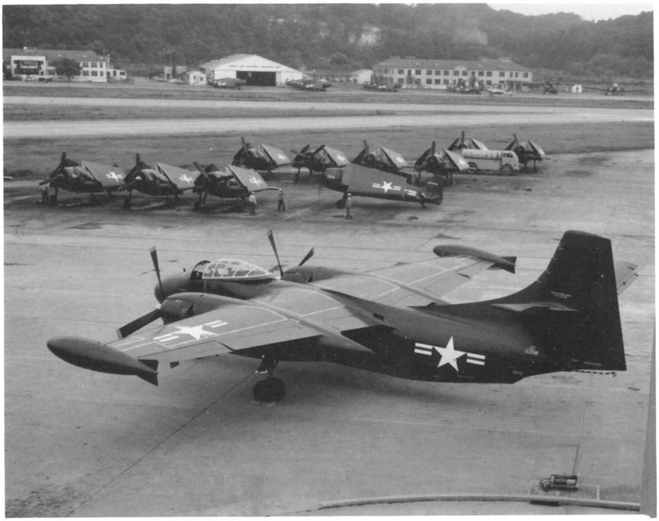
XAJ-1 121460 as seen later in its career with a non-sliding AJ-1 canopy installed. The XAJ-1s and the AJ-1s had a single piece nose gear door as seen here. The XAJ-1 was finished in natural metal overall with off-white radome and fin cap which later faded to a cream color. The rear fuselage strake which was used on the XAJ-1 and the AJ-1 can be seen above and forward of the tailhook. (National Archives)



THE AJ-I

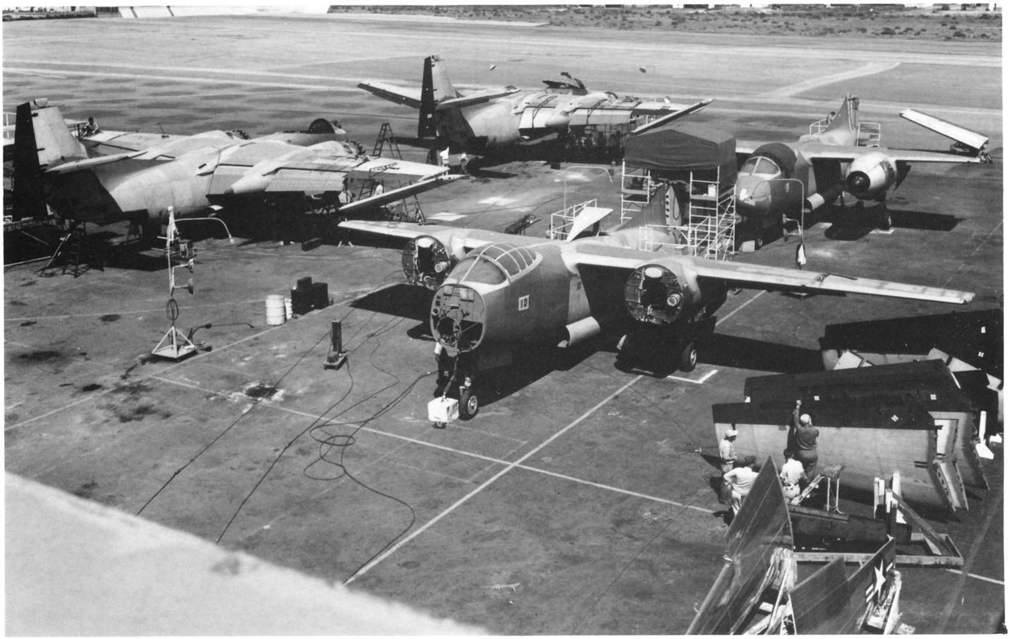
Changes between the XAJ-1 and the AJ-1 were minimal with the XAJ-1 having a single piece bubble canopy and tighter fitting engine nacelles. The AJ-1, which had seen orders of forty aircraft prior to the flight of the XAJ-1, received an additional order for fifteen aircraft on 30 September 1949 which brought the total production of the AJ-1s to fifty five aircraft.

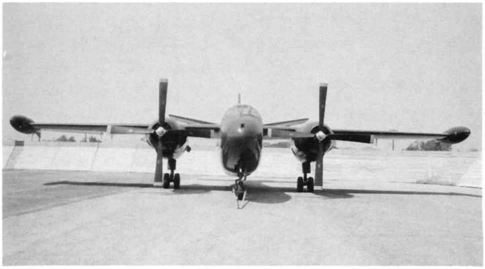
Shortly after the first flight of the production AJ-1 (122590) in May 1949, a number of AJ-1s were flown to the Naval Air Test Center (NATC), NAS Patuxent River, Maryland, and to NAS Moffett Field, California, for Board of Inspection and Survey (BIS) and Fleet Indoctrination Programs (FIP). VC-5 received its first AJ-1 in September 1949 and also participated in the FIP carrier trials. After months of simulated landing and take-off test hops at Patuxent River, Captain Hayward made the first AJ-1 carrier take-off from the USS Coral Sea (CVB-43) on 21 April 1950. This was followed by the first landing on 31 August 1950.

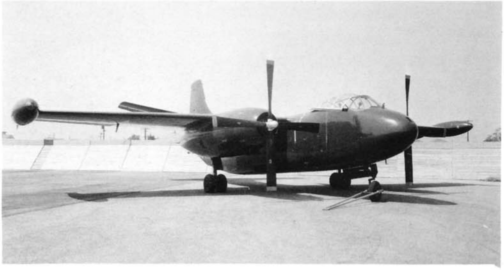


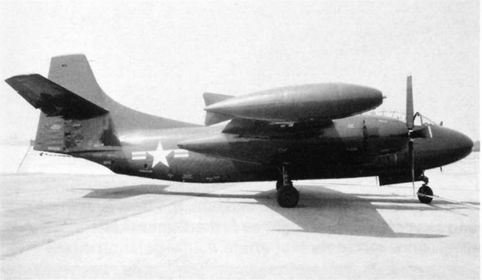
Above, the second production AJ-1 122591 with sliding clamshell canopy with white painted framing as seen from above at NAS Anacostia, Washington D. C., on 8-29-49. (National Archives)

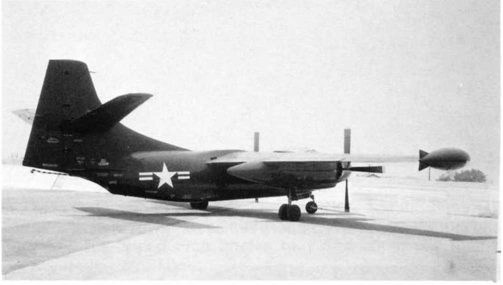
Below, Savage outdoor production line at Inglewood, California, with four AJ-1s under construction. Wing and tailplane components can be seen in the foreground. These AJ-1s are fitted with the sliding canopy. (NAA via Pace)







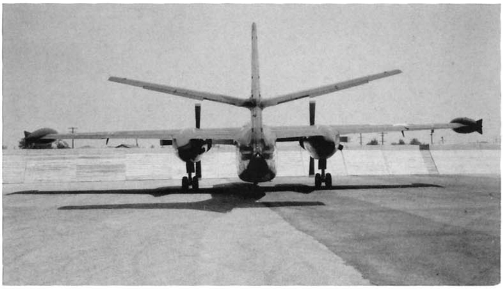


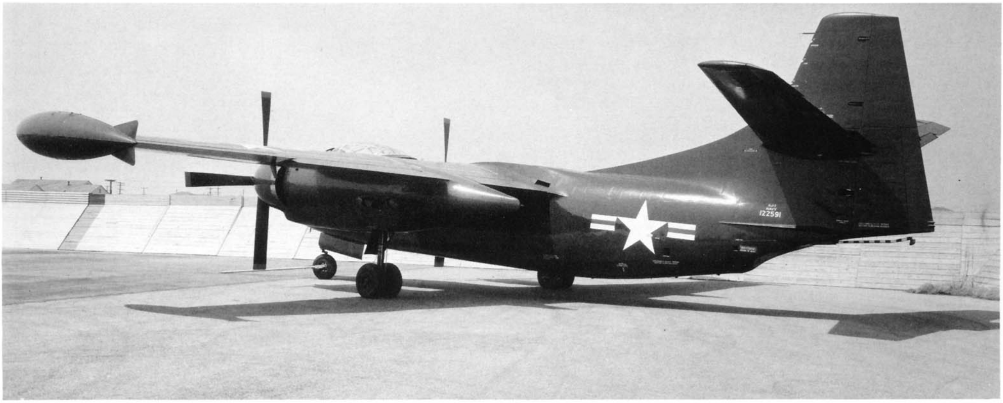


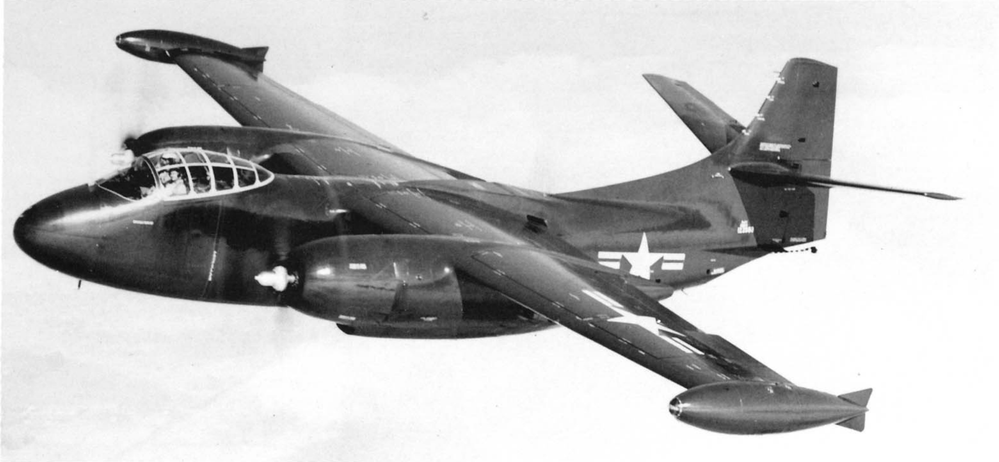
WALKAROUND

OF AN EARLY PRODUCTION AJ-1

Walkaround of 122591 at Inglewood prior to delivery to the Navy. Upward canted tailplanes, after-fuselage strakes, short vertical tail and one piece nose gear door distinguished the AJ-1 from the AJ-2 prior to the AJ-1 retrofit program which brought the AJ-1s up to approximate AJ-2 standards. (NAA via Pace)

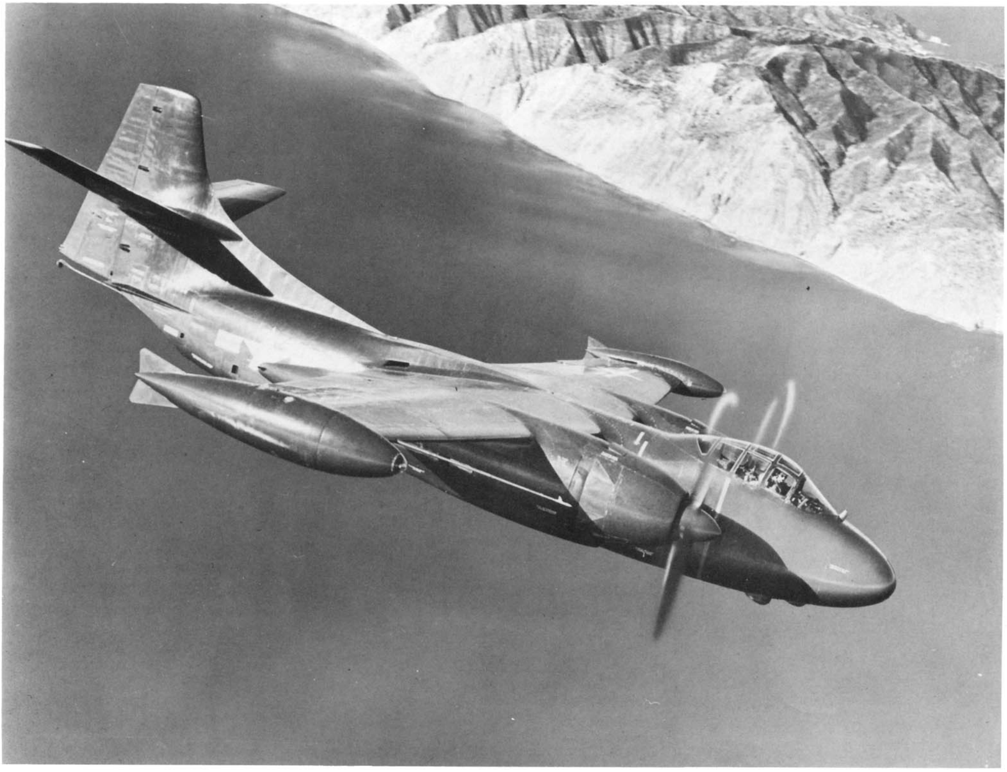


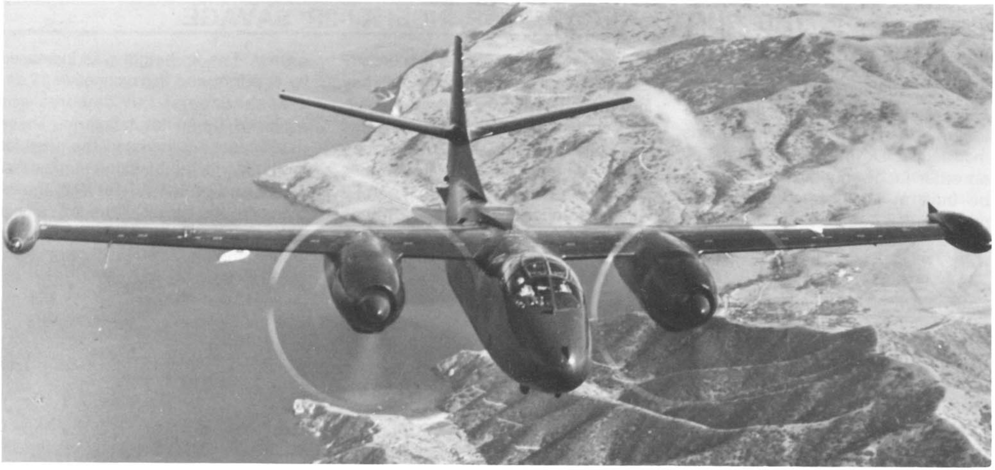




Early production AJ-1 122593 in flight with clamshell canopy and with its prop spinners removed. (NAA via Pace)

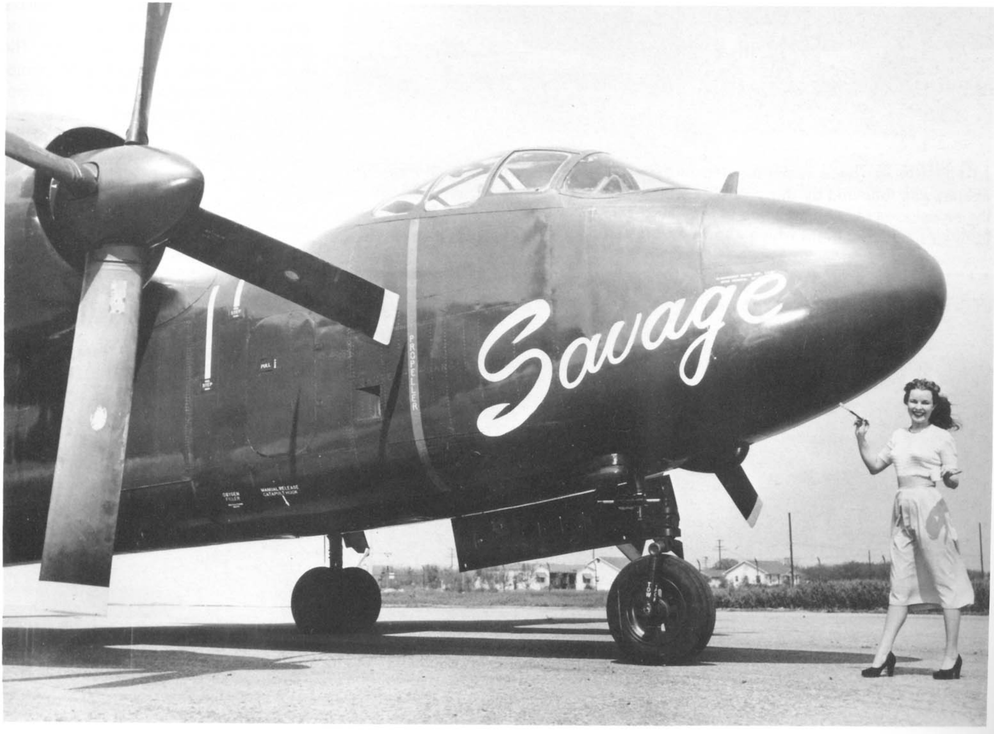
AJ-1 with prop spinners added and with the heavily framed non-sliding canopy added in flight over the Channel Islands. (NAA)





Head on view of the AJ-1 which shows the dramatic horizontal stabilizer dihedral and the box-like jet engine intake housing which starts just aft of the wing. (NAA)

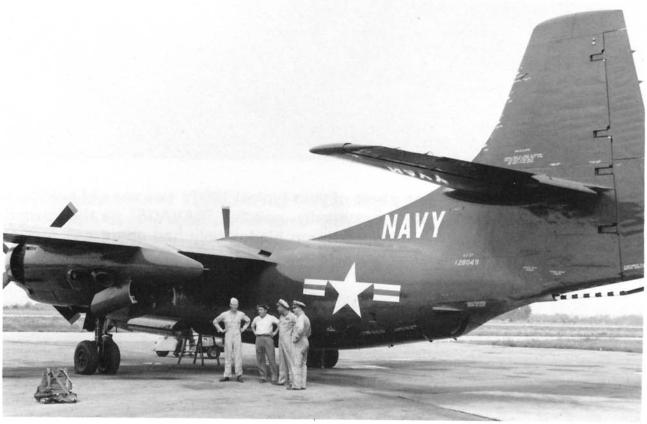
Public relations photo of your typical 1950's sweater girl holding a paint brush after supposedly painting "SAVAGE" on the forward fuselage. The flat-tipped prop blades only had about one foot of ground clearance. (NASM)



THE PHOTO RECONNAISSANCE AJ-2P SAVAGE

The Navy decided to produce an improved version of the AJ-1 for the photo reconnaissance role, known initially as an AJ-1P. AJ-1 124850 was modified at Downey, California, and an order for twenty-three AJ-2P's to be built at Columbus, Ohio, was placed on 18 August 1950.

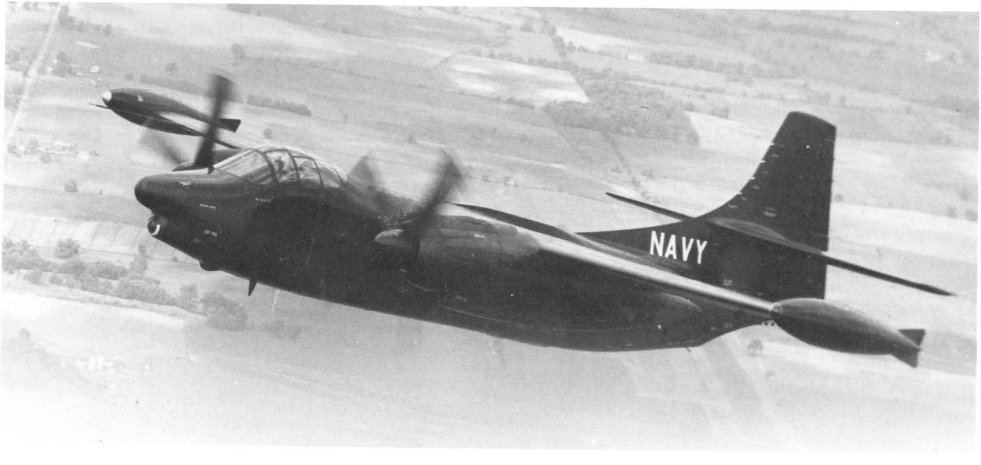
Besides the obvious modifications for the photo role, a redesigned camera nose and a redesigned bomb bay housing down-looking and side-looking high resolution cameras and photo flash bombs, the AJ-2P incorporated many other improvements which were also used on the AJ-2 attack bomber. Up-rated R-2800-48 and J33-A-10 engines were used and the tail section was significantly redesigned. The fin height was increased by one foot and the distinctive 12 degree horizontal tail dihedral was replaced by a flat tailplane. These modifications eliminated the need for the horizontal aft fuselage strakes that were used on the AJ-1s. With the increase in the height of the tail came a corresponding increase in rudder size which lengthened the fuselage slightly. The troublesome AJ-1 hydraulic system was replaced and additional internal fuel capacity was added.



AJ-1 128049 was used as the AJ-2P prototype and was converted in Califorina. This aircraft was followed by thirty AJ-2Ps which were built at Columbus, Ohio. Notice the redesigned tail and absence of the rear fuselage strakes. (NAA via Pace) Below prototype AJ-2P in flight which shows off the distinct photo nose. (NAA)

CREW CHARACTERISTICS OF THE AJ-2P

In the AJ-2P the pilot's stick was replaced with a wheel and the throttle controls remained on the left console. AJ-2Ps 128043-128054 and 129185-129189 had a crew of three with the third crewman seated in a compartment forward of the bomb bay. AJ-2Ps 129190-129195, 130422-130425, and 134073-134075 carried a crew of four, with the fourth seat on the upper flight deck facing aft. The four man crew consisted of photo-plane commanders (PPC's), photo-navigators, photo technicians, and plane captains. The majority of the aviators assigned were graduates of the Aerial Photo School at NAS Pensacola, where they completed 21 weeks of training.

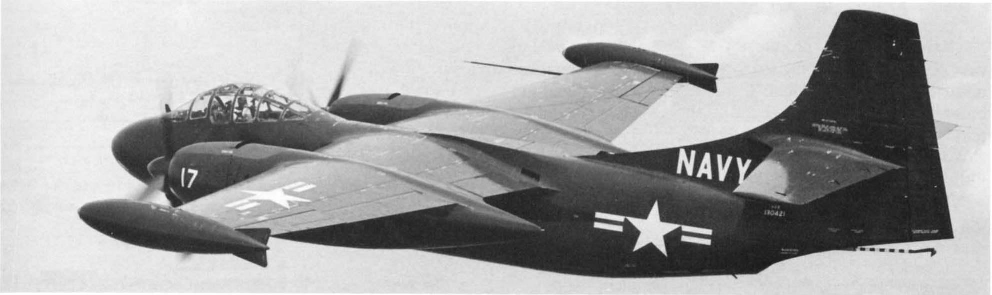


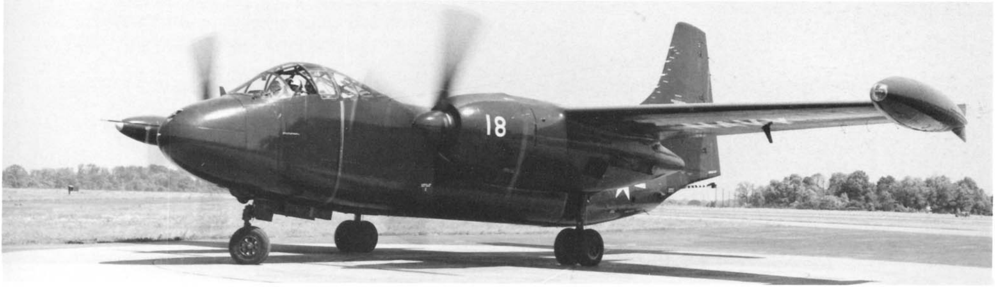
THE AJ-2 SAVAGE

The AJ-2 incorporated all the changes mentioned in the AJ-2P as well as differing in cockpit layout from the AJ-1. The AJ-1 had a separate compartment for the third crewman, whereas the AJ-2 housed all three together on the upper flight deck with the third crewman sitting backwards. The stick and throttle controls which were located on the pilot's left on the AJ-1 were replaced with a control wheel and the throttles were moved to a center console where other crewmen could aide the pilot if needed, much as the co-pilot would in a PBJ (B-25).

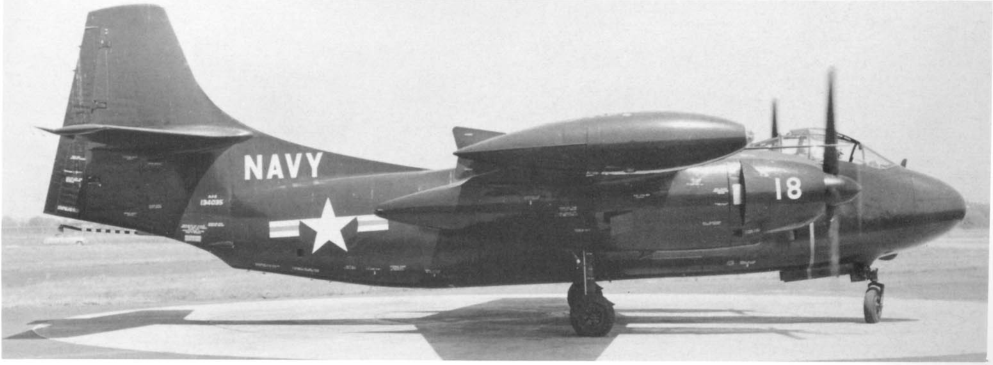
On 14 February 1951, 55 AJ-2s were ordered, and on 14 August 1952 a contract was signed to modify 42 AJ-1s to approximate AJ-2 standards.

The 17th production AJ-2 130421 on a manufacturer's test flight. When delivered the #17 would be removed. (NAA)





Two views of the eighteenth production AJ-2 on the compass rose on 6-4-53. The upper portions of the engine nacelles were painted flat black to reduce glare. (NAA)



THE AJ-3 PROPOSAL

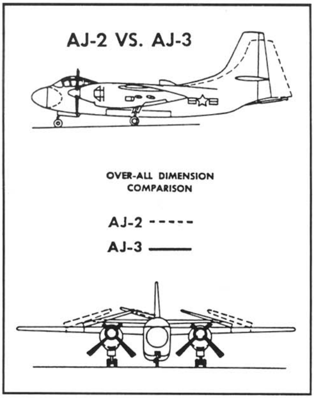
Because of carrier handling problems a smaller version of the Savage was proposed which would fit on the forward centerline elevator on the 27A carriers. The AJ-3 was characterized by a 42 foot folded wingspan with internally mounted folding mechanisms and a length of 56 feet with a folding nose.

THE XA2J-1 SUPER SAVAGE

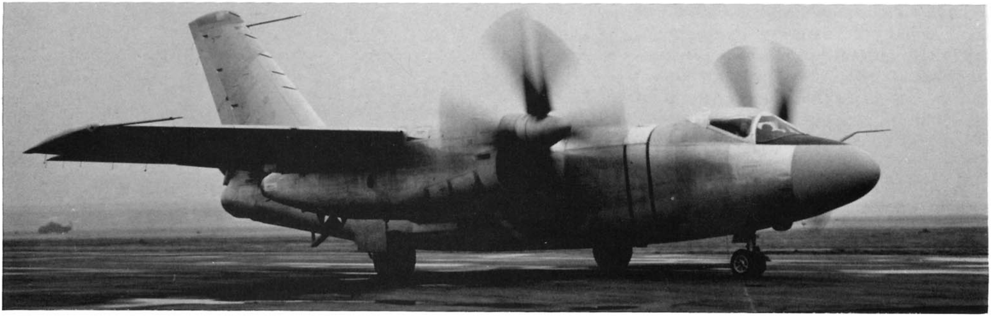
Before the first production AJ-1 was completed and only four months after the first XAJ-1 flight, the Navy ordered two prototypes and a static test airframe of the XA2J-1. The XA2J-1 was larger and heavier than the AJ-1 with a massive sweptback vertical fin, which was needed to control the two 5035 hp Allison T40-A-6 engines. The troublesome engines, which drove six-blade contrarotating props, were barely able to pull the XA2J-1 as fast as a production AJ-2. The XA2J-1 first flew on 4 January 1952 and had such a short test program that the second prototype never flew and the twin radar controlled 20mm tail cannons were not installed.

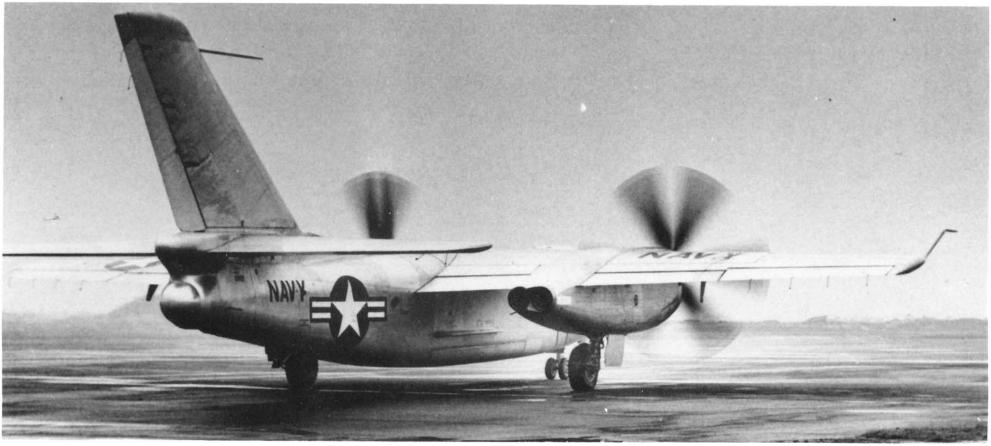
THE XA2J-2 PROPOSAL

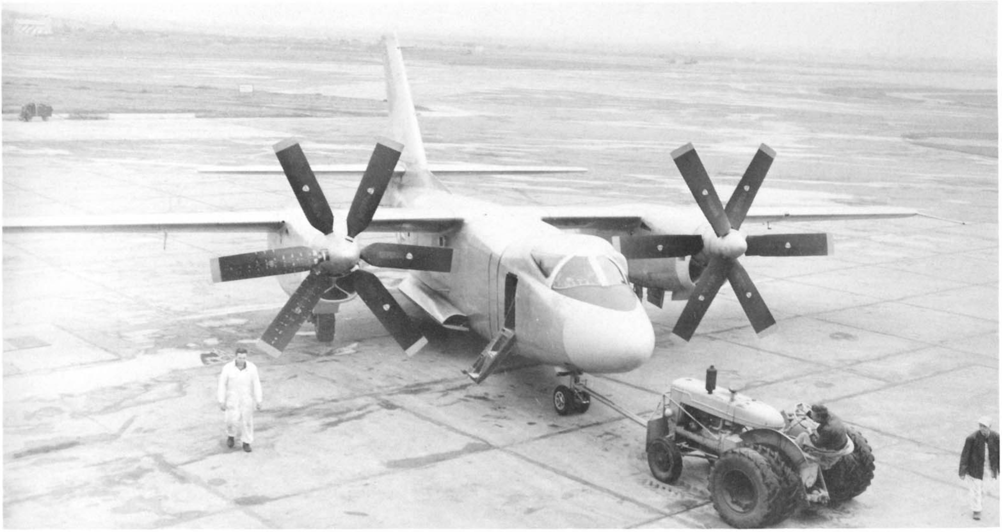
In late 1951 another turboprop proposal designed around the smaller MK 5 weapon was put forth. The XA2J-2 was to have a 61 feet 10 inch wingspan and a length of 55 feet and have a 6,000 pound bomb load with a radius of 932 nautical miles. This version of the Savage would have been capable of close air support and mine laying.



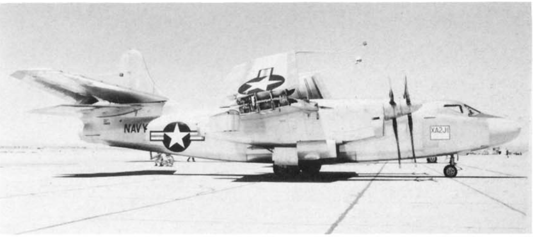
Massive XA2J-1 taxiing out for a test flight from Los Angeles on 3-5-53. (NAA)





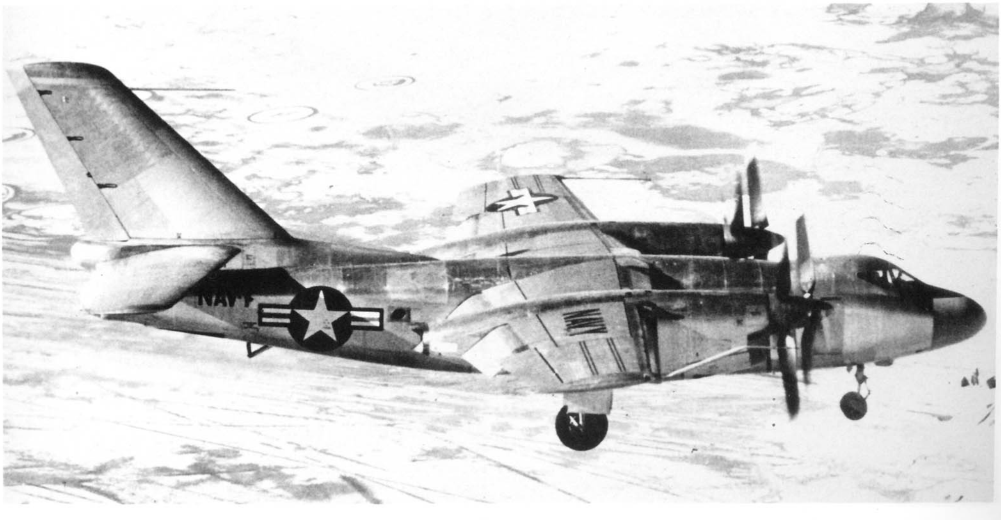


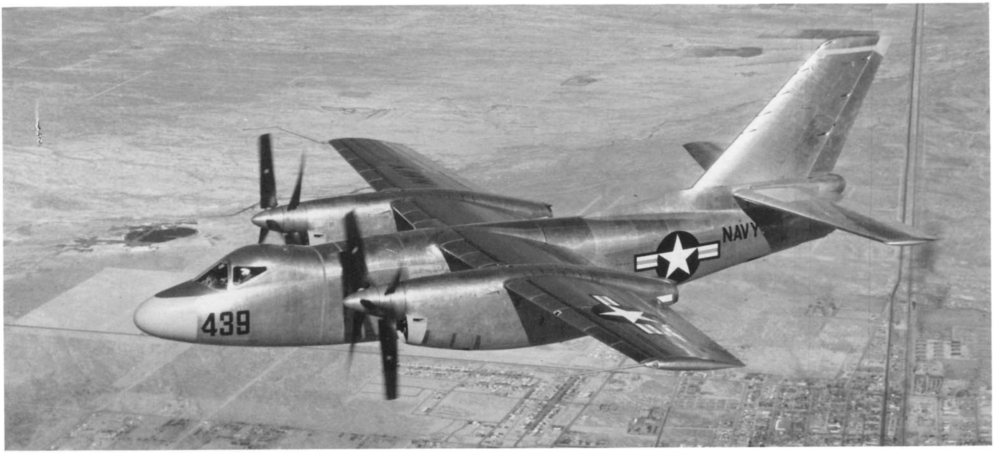
XA2J-1 being towed shows the size and shape of the massive six-bladed props, AJ style bomb bay doors and open crew door. (Bowers via Menard)



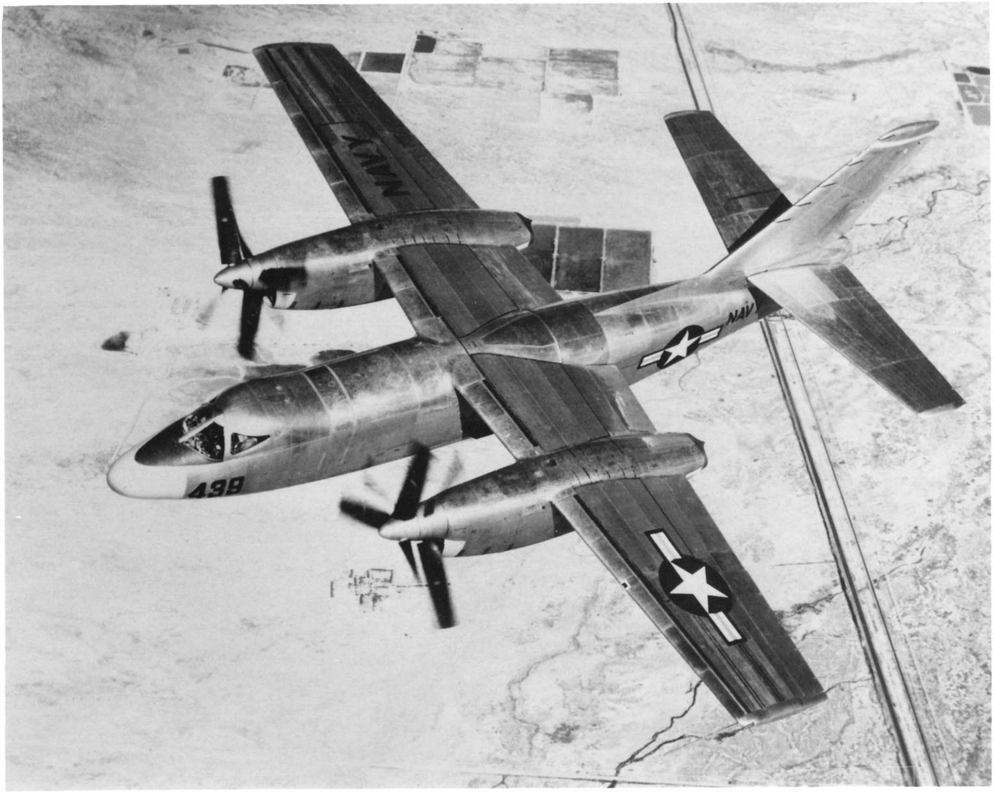
XA2J-1 124439 at Edwards AFB (Muroc Field) during an open house, with wings and tail folded. The false tail sticking up behind the XA2J-1 was from a B-29. (W. J. Balogh via Menard)

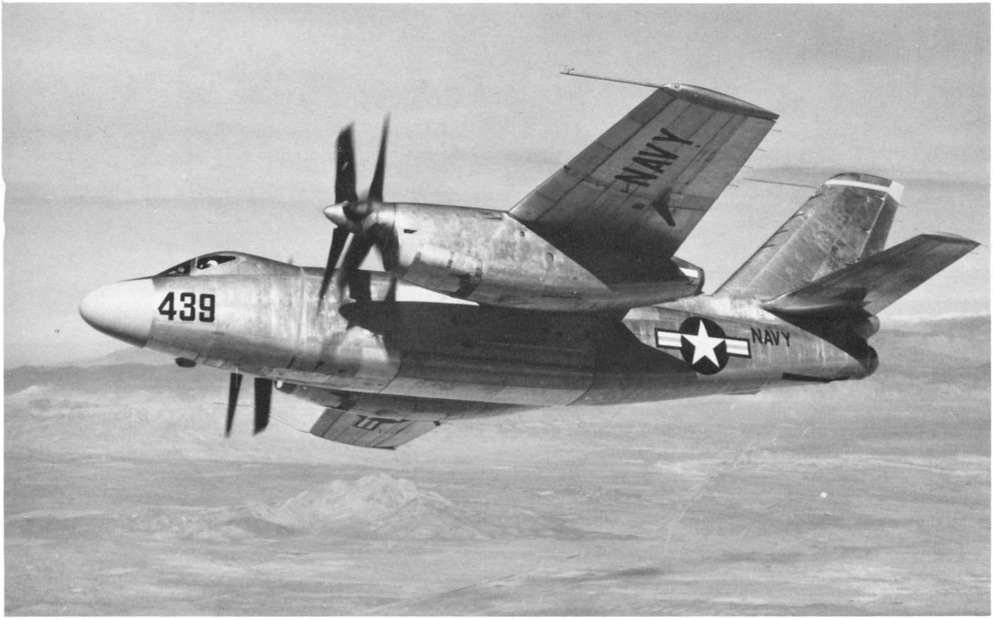
XA2J-1 124439 in the landing configuration over Muroc dry lake. (NASM)





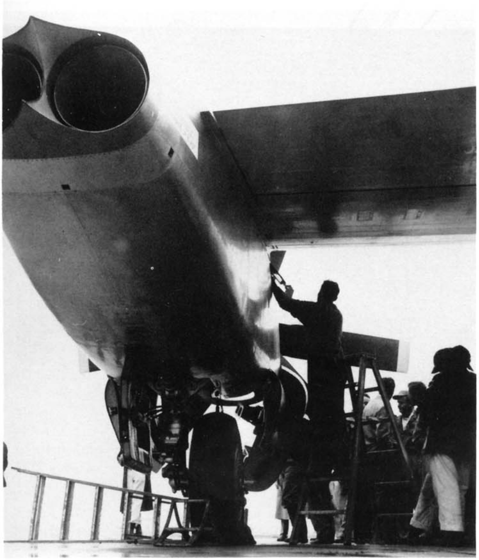
Two views of the XA2J-1 from above while over the Mojave Desert. (NAA)

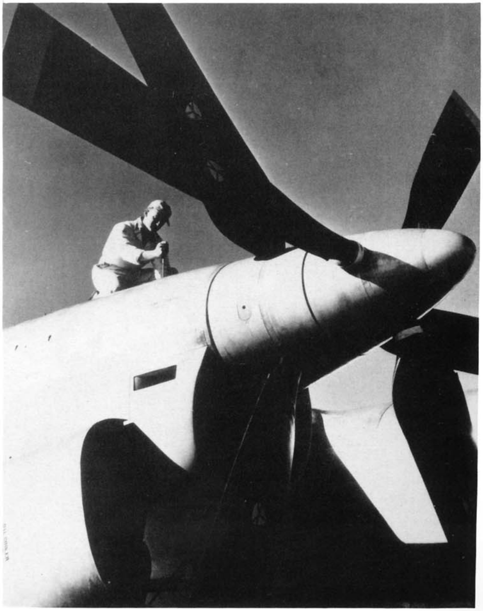


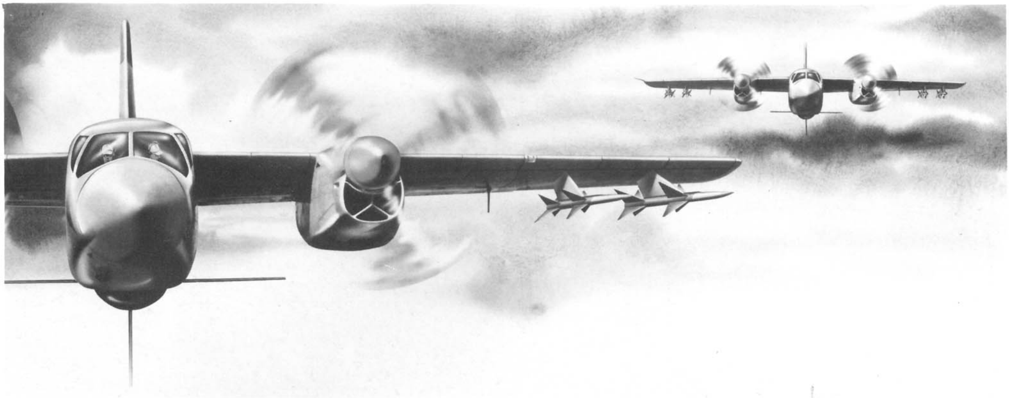


Above, XA2J-1 banks away from the camera ship on a test flight out of Muroc Dry Lake. (NAA)

Below right, huge size of the counter-rotating props is evident when compared to the size of the mechanic working on the top of the engine. Below left, shape of the exhaust end of the engine nacelle on the XT-40 engines. (NAA)

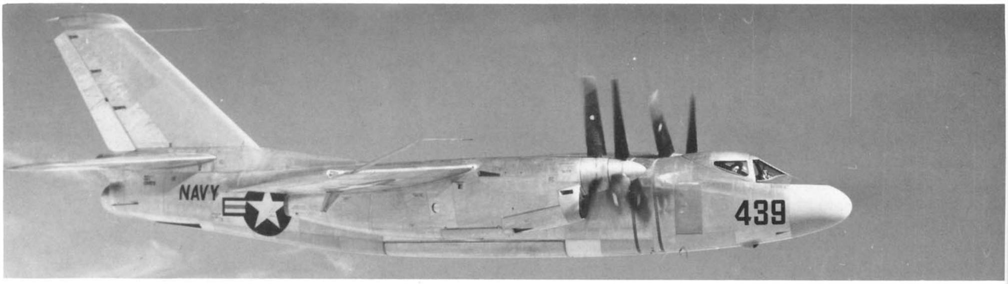


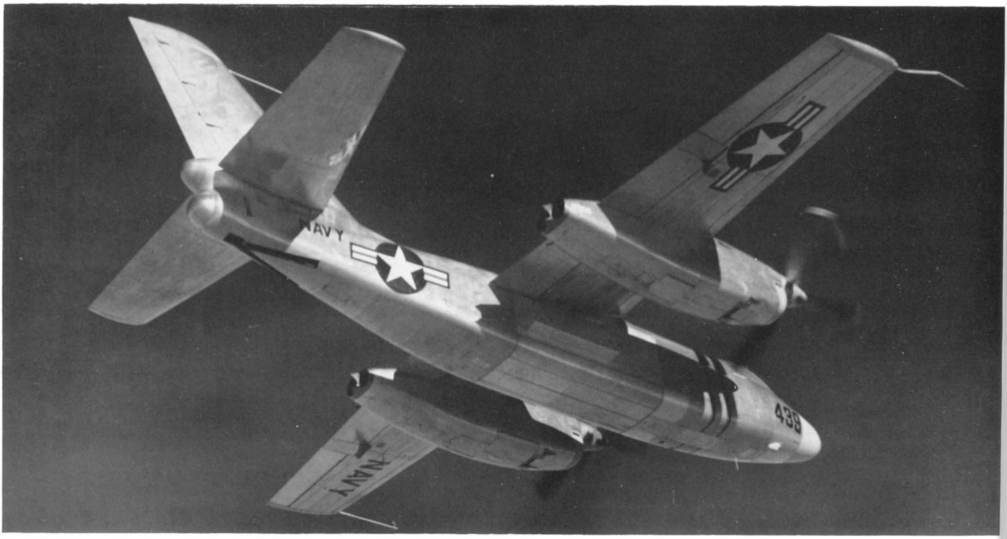


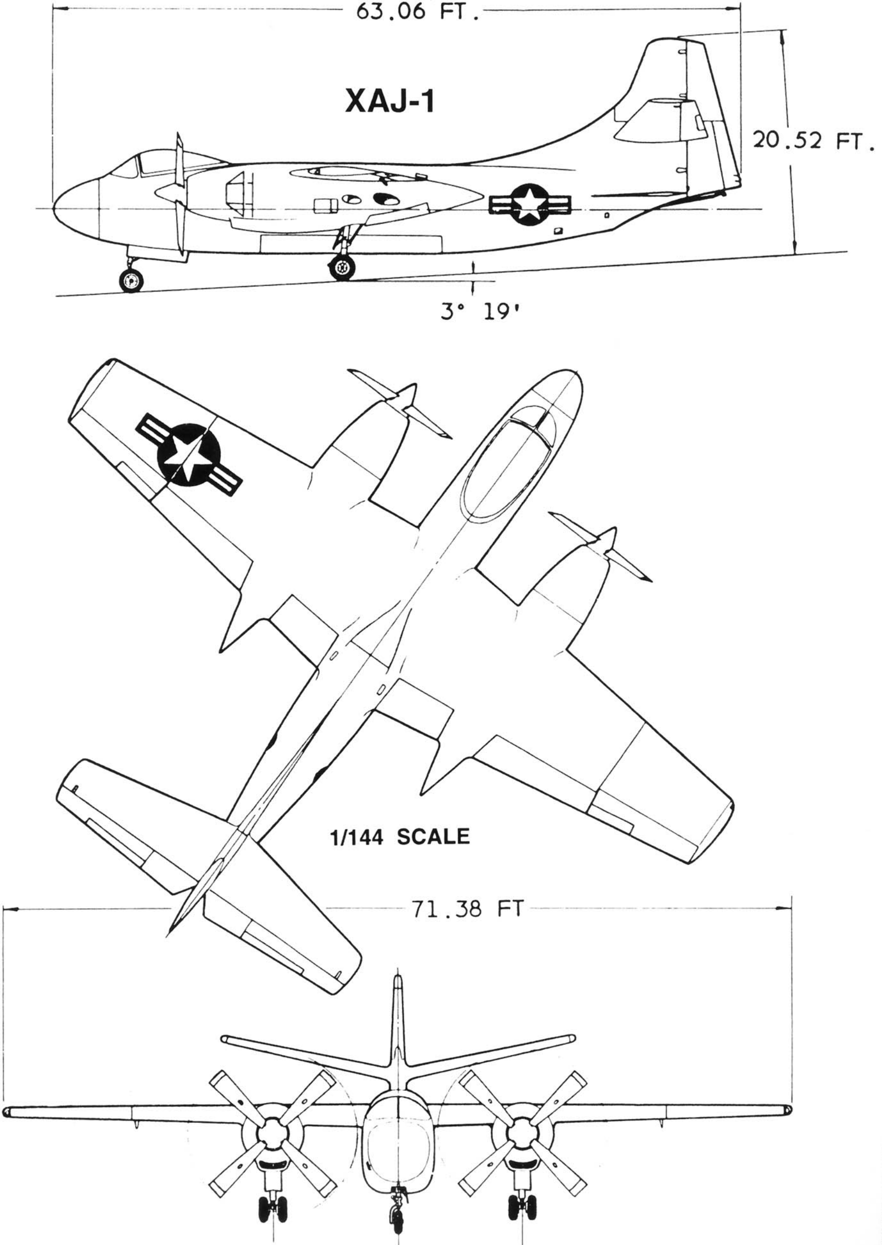


Artist's impression of the XA2J-1 carrying Sparrow missiles and a fuselage mounted stand-off bomb. (via C. Kaston)

Below, side view and bottom, belly view of the XA2J-1. (NAA)



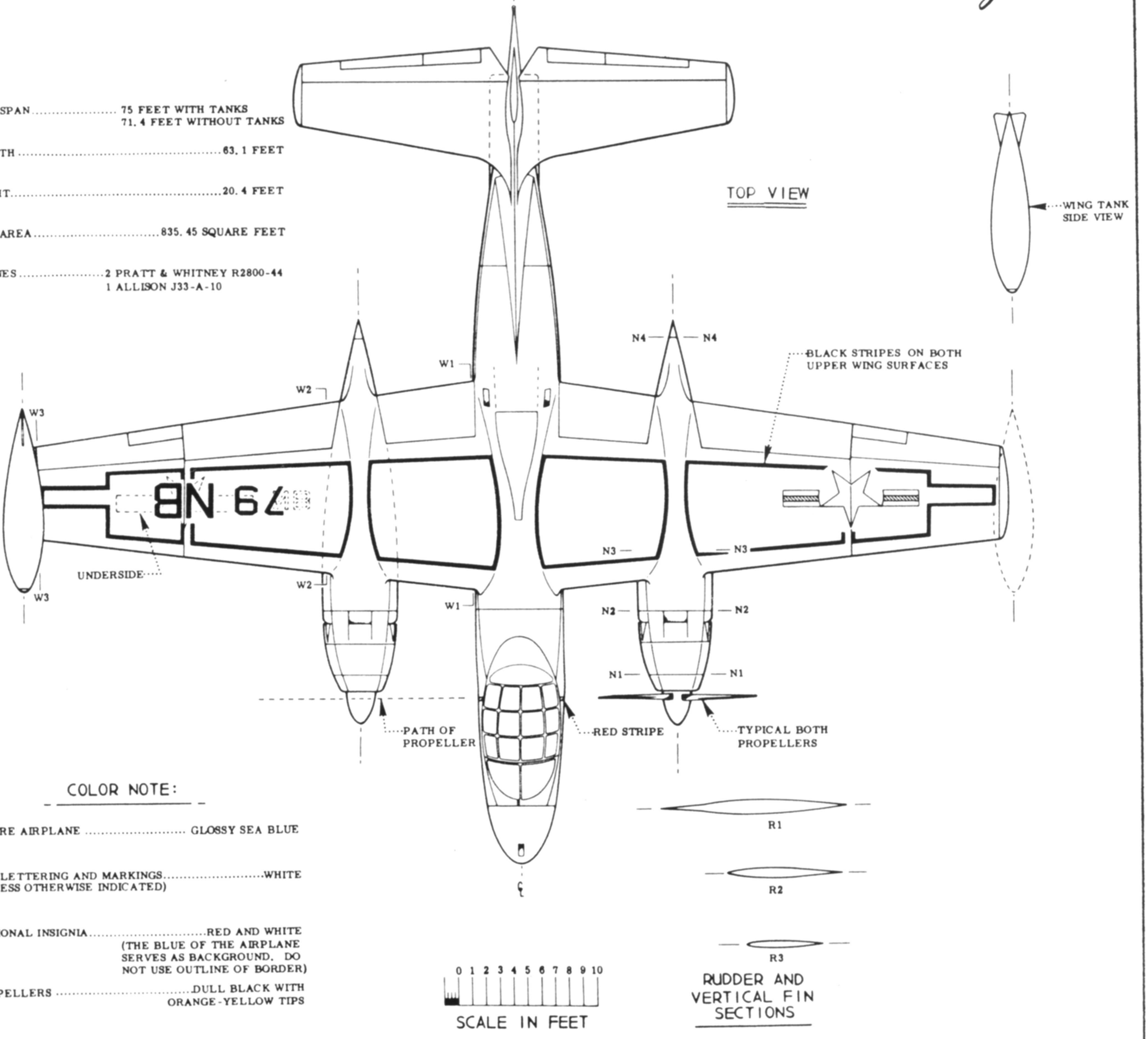



63.06′ FT.
XAJ-1
20.52 FT.
3° 19'
1/144 SCALE
71.38 FT
22.67 FT

NORTH AMERICAN

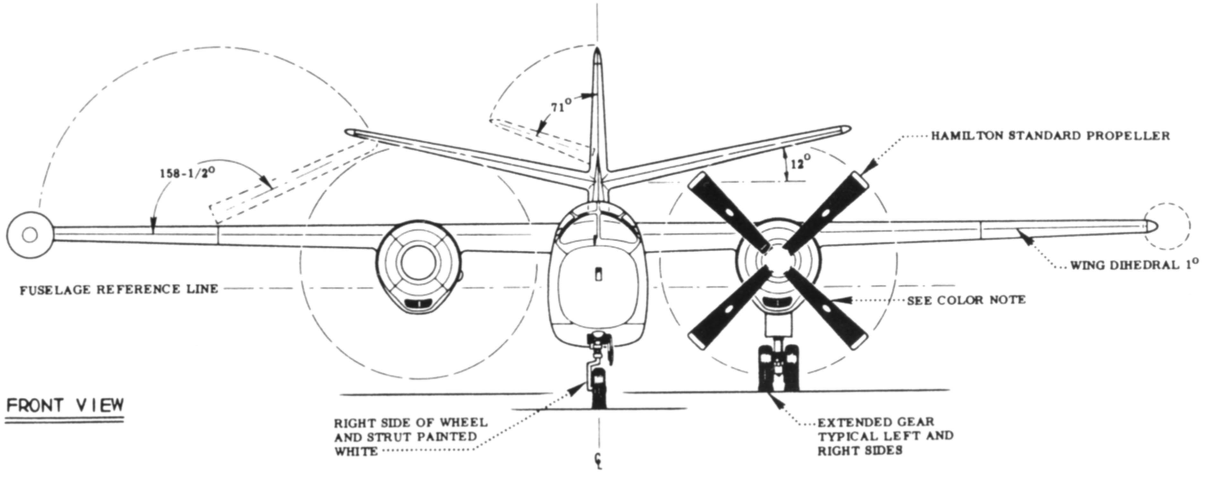
AJ-1 *Savage*

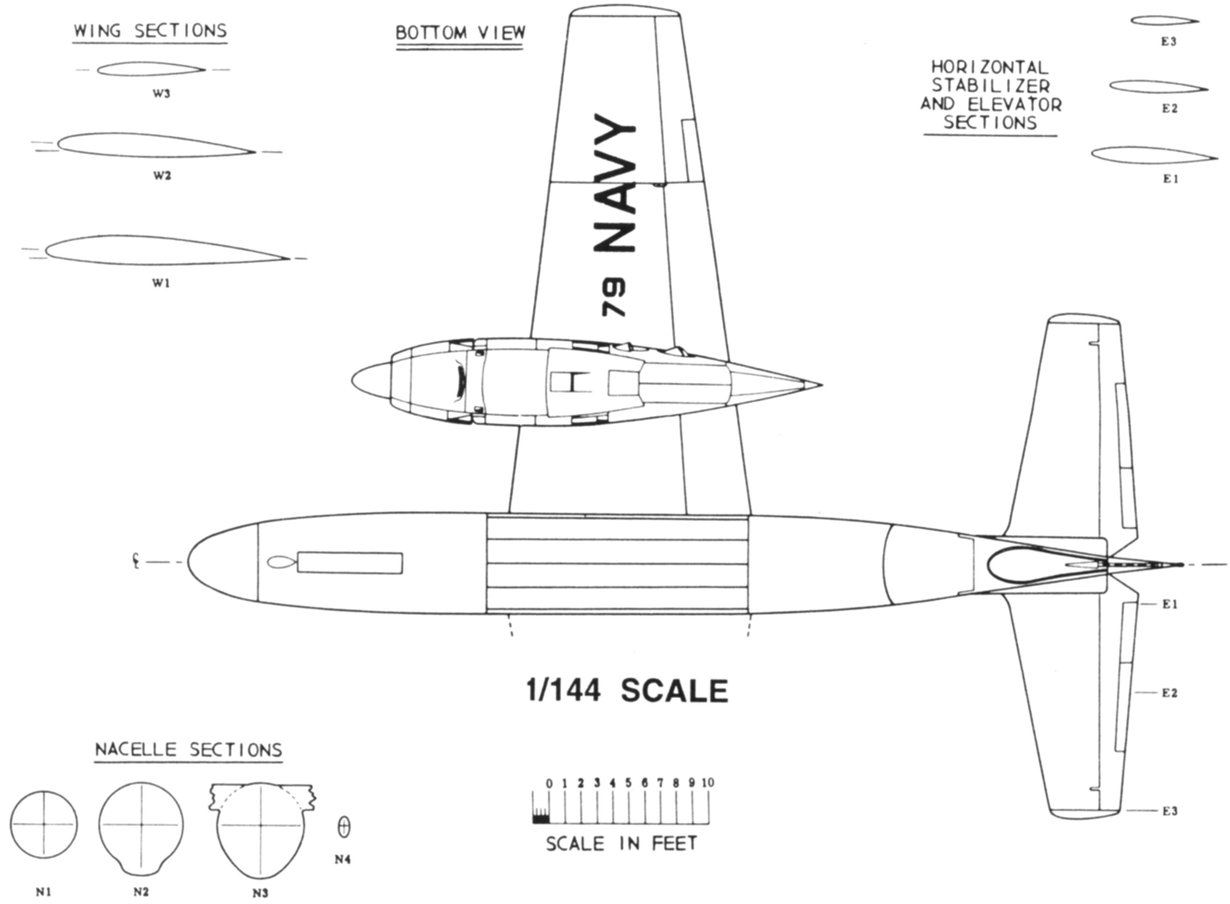
WING SPAN	75 FEET WITH TANKS 71.4 FEET WITHOUT TANKS
LENGTH	63.1 FEET
HEIGHT	20.4 FEET
WING AREA	835.45 SQUARE FEET
ENGINES	2 PRATT & WHITNEY R2800-44 1 ALLISON J33-A-10



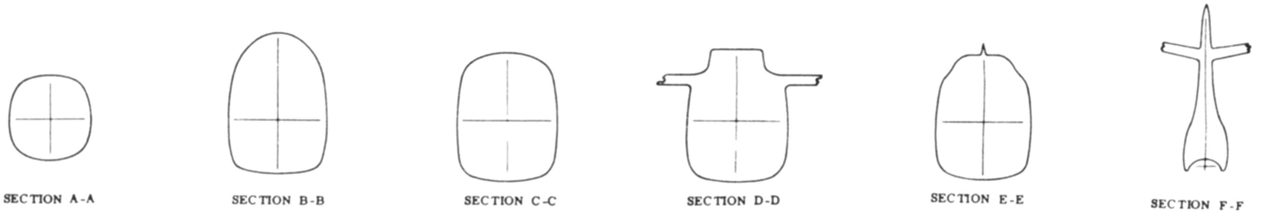
COLOR NOTE:

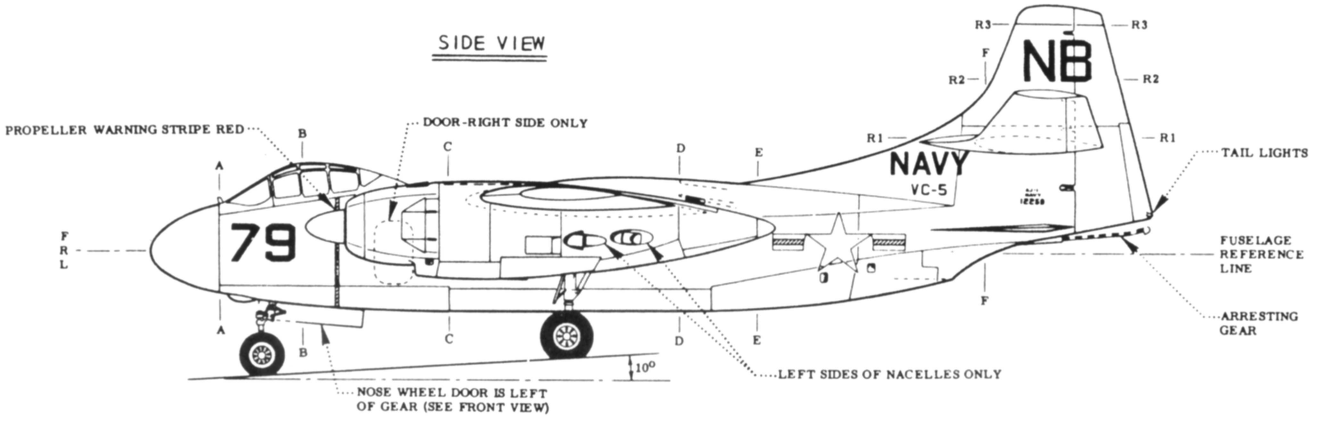
ENTIRE AIRPLANE	GLOSSY SEA BLUE
ALL LETTERING AND MARKINGS (UNLESS OTHERWISE INDICATED)	WHITE
NATIONAL INSIGNIA	RED AND WHITE (THE BLUE OF THE AIRPLANE SERVES AS BACKGROUND. DO NOT USE OUTLINE OF BORDER)
PROPELLERS	DULL BLACK WITH ORANGE-YELLOW TIPS


71°
158-1/2°
12°
HAMILTON STANDARD PROPELLER
WING DIHEDRAL 1°
FUSELAGE REFERENCE LINE
SEE COLOR NOTE
FRONT VIEW
RIGHT SIDE OF WHEEL AND STRUT PAINTED WHITE
EXTENDED GEAR TYPICAL LEFT AND RIGHT SIDES
℄



FUSELAGE CROSS SECTIONS





COCKPIT EVOLUTION 1/72 SCALE

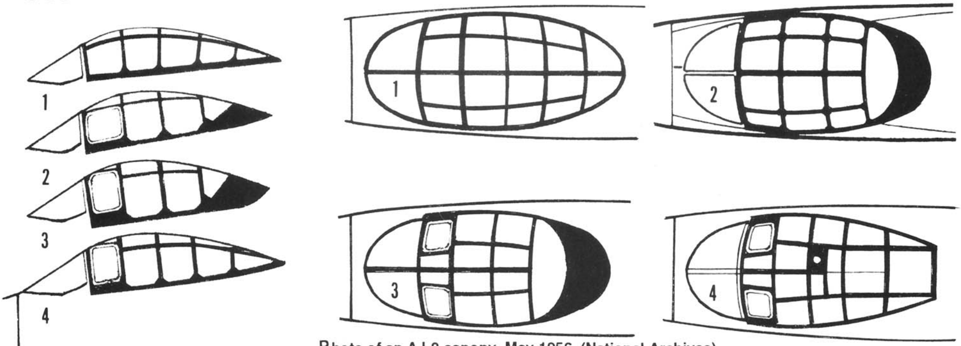
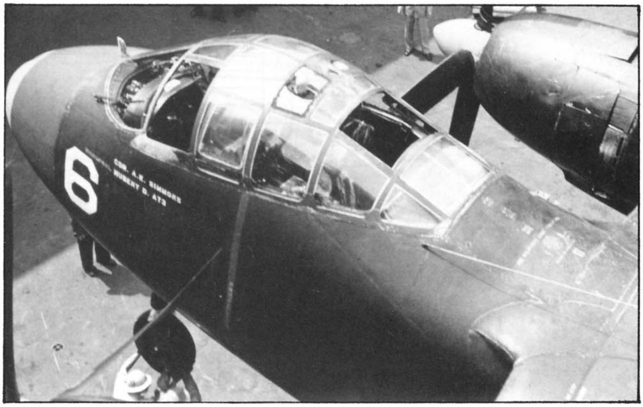
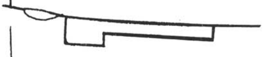
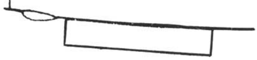


Photo of an AJ-2 canopy, May 1956. (National Archives)



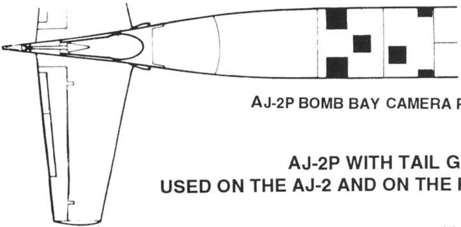
AJ-2/2-P TWO PIECE NOSE GEAR DOOR



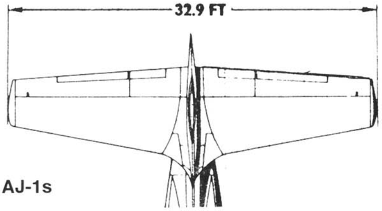


AJ-1 NOSE GEAR DOOR

1.) EARLY AJ-1 SLIDING CANOPY.
2.) AJ-1 CANOPY.
3.) EARLY AJ-2P CANOPY AND RETROFITTED AJ-1 CANOPY.
4.) AJ-2 AND LATE AJ-2P CANOPY. (AJ-2P 129190 AND LATTER)

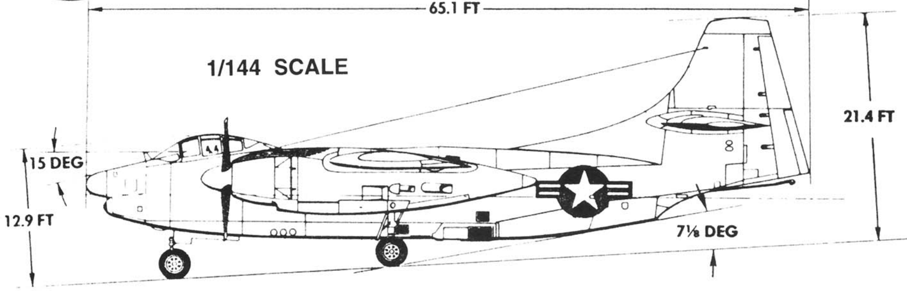


AJ-2P BOMB BAY CAMERA PORTS

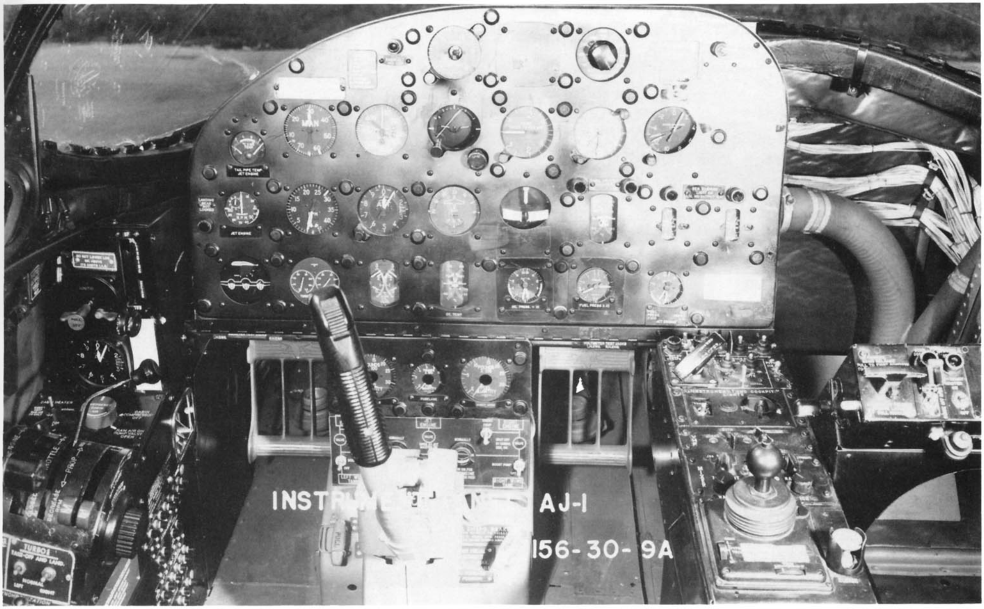


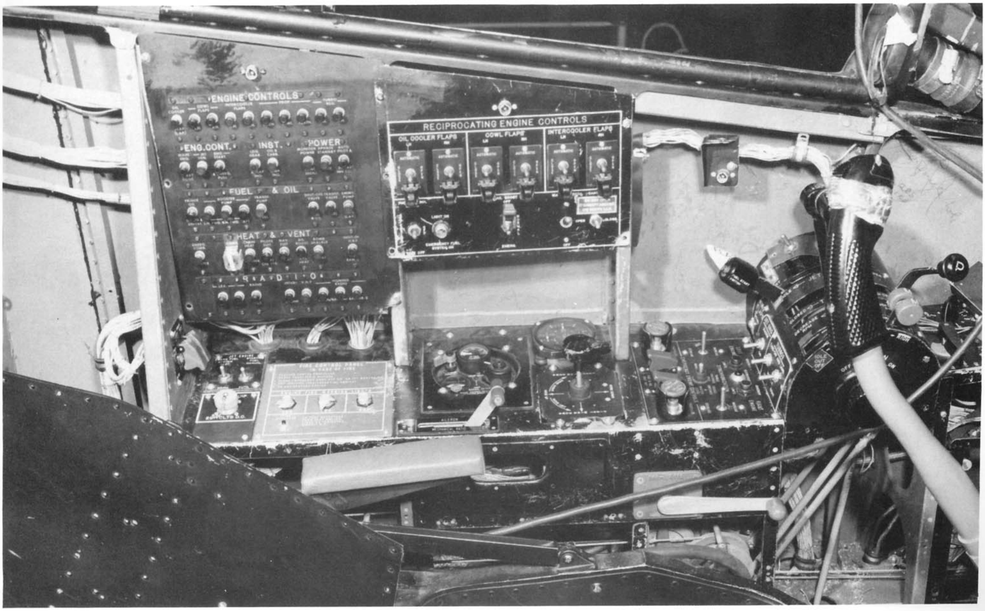
AJ-2P WITH TAIL GROUP USED ON THE AJ-2 AND ON THE RETROFITTED AJ-1s

1/144 SCALE

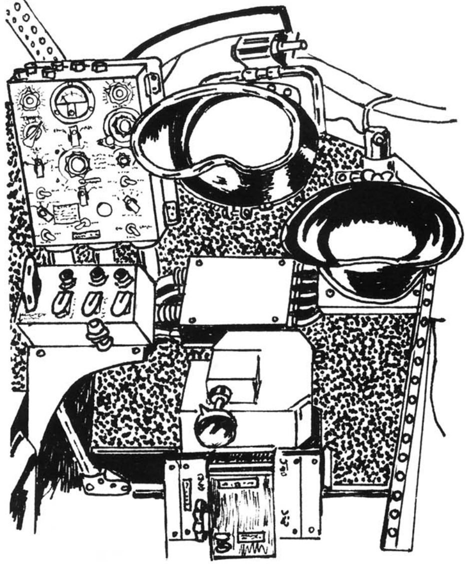


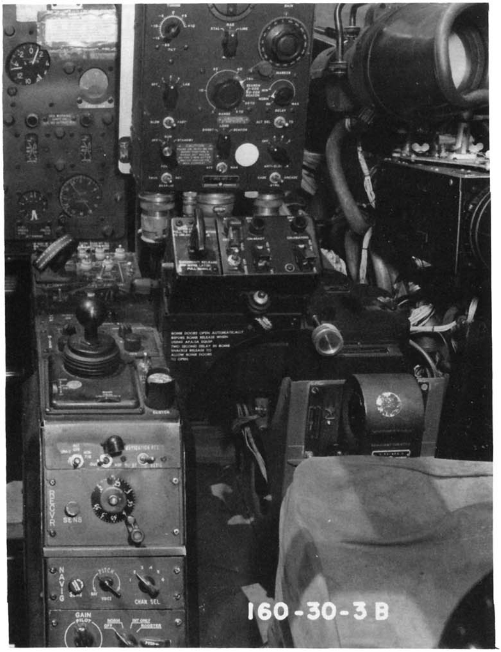
AJ-1 INSTRUMENT PANEL AND LEFT CONSOLE WITH SEAT RECLINED



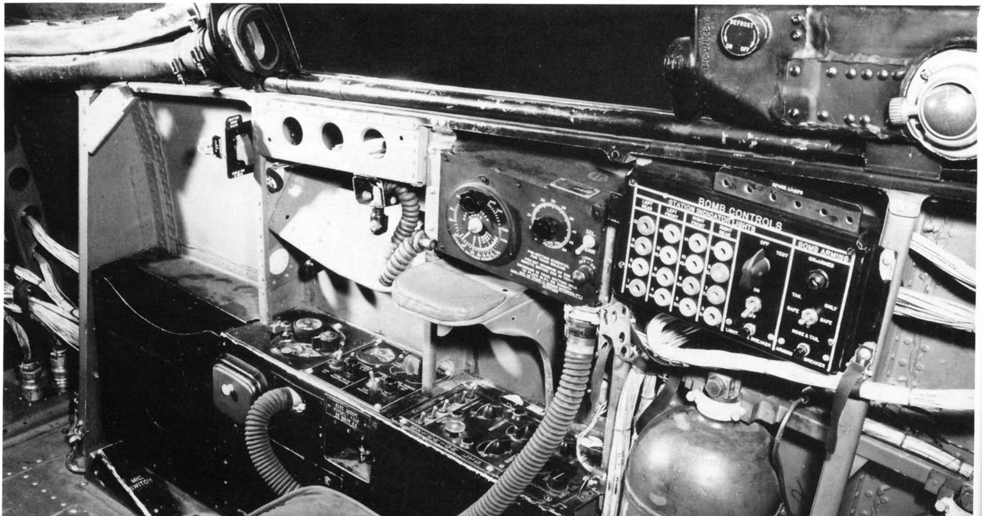


BOMBER-NAVIGATOR'S STATION

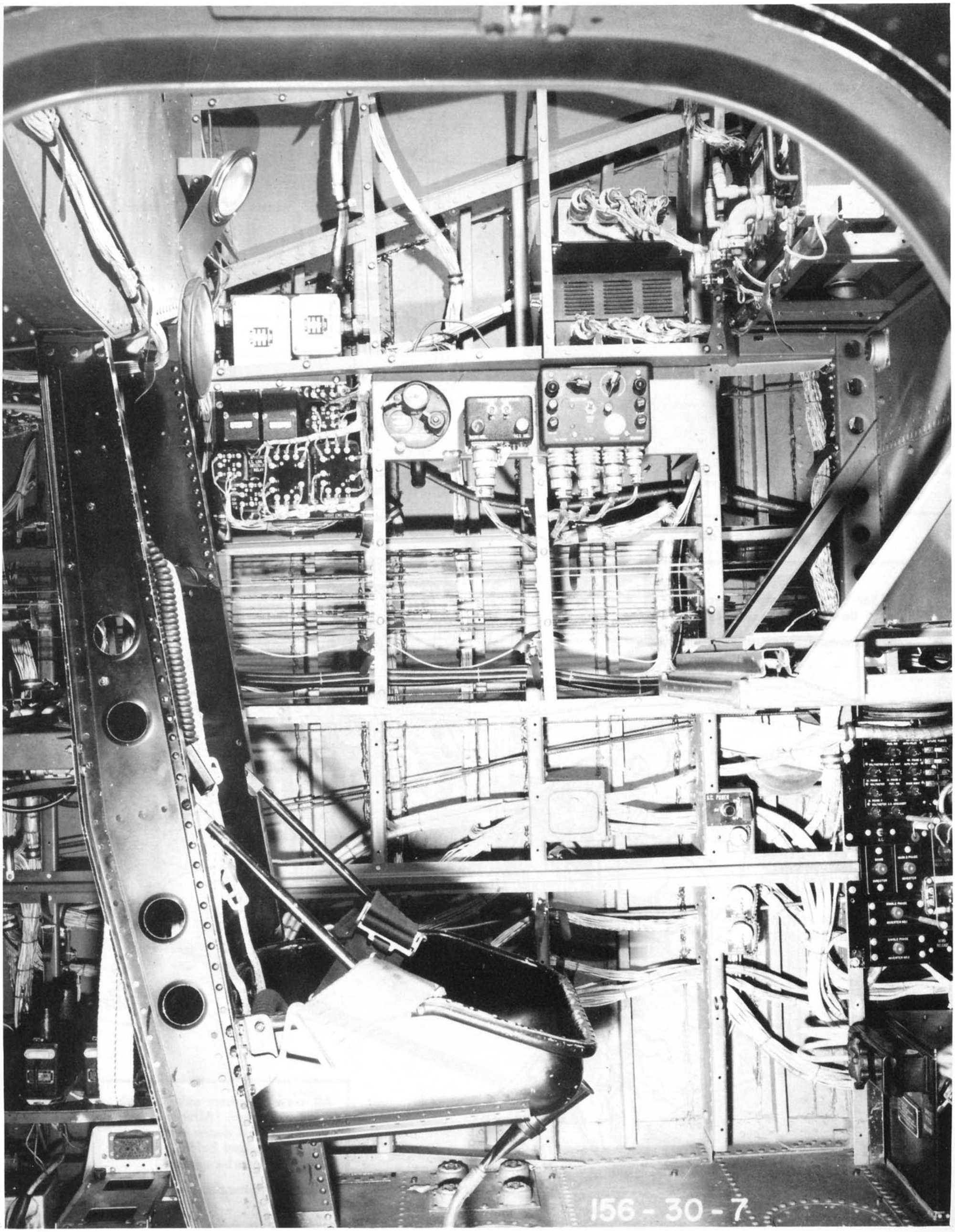


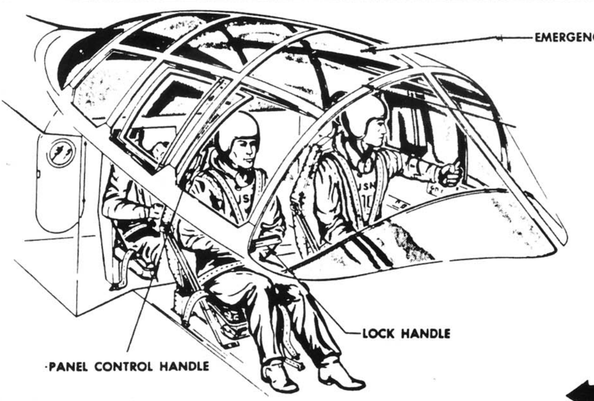


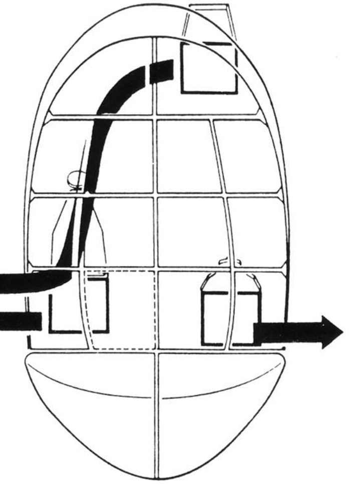
AT RIGHT, AJ-1 CENTER CONSOLE.
BELOW, BOMBER-NAVIGATOR RIGHT CONSOLE.



THIRD CREW MEMBERS STATION LOOKING THROUGH THE CREWS ENTRANCE DOOR TO THE OPPOSITE SIDE OF THE FUSELAGE







Ditching Positions and Exits

Open canopy sliding panels before ditching. (If time is available, prepare to remove emergency egress panel.)

Close and lock hatch to bomb bay before ditching.

After ditching, lower back of bomber-navigator's seat to facilitate exit of third crew member. If time permits, remove emergency egress panel.

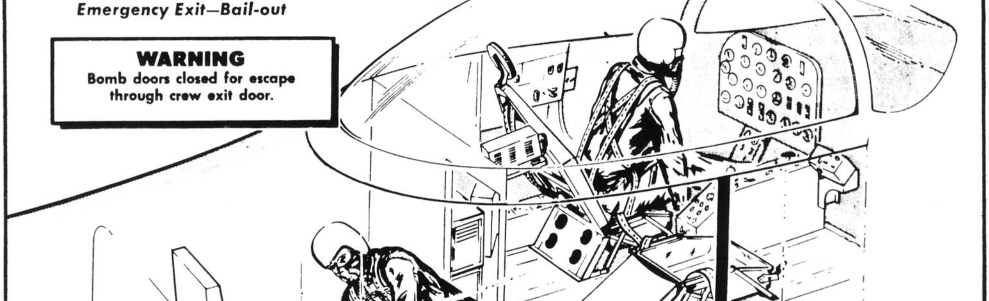
WARNING

Do not remove emergency egress panel in flight.

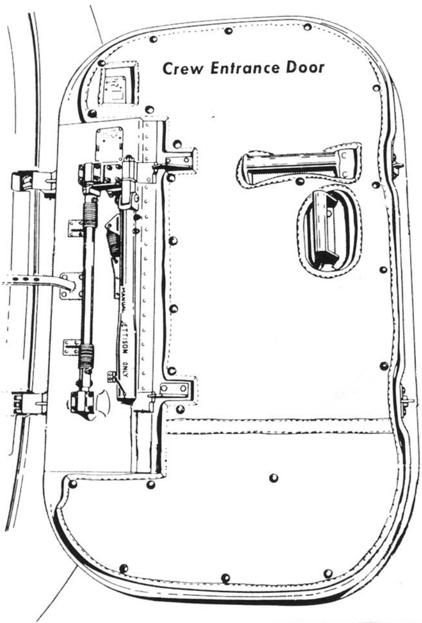
Emergency Exit—Bail-out

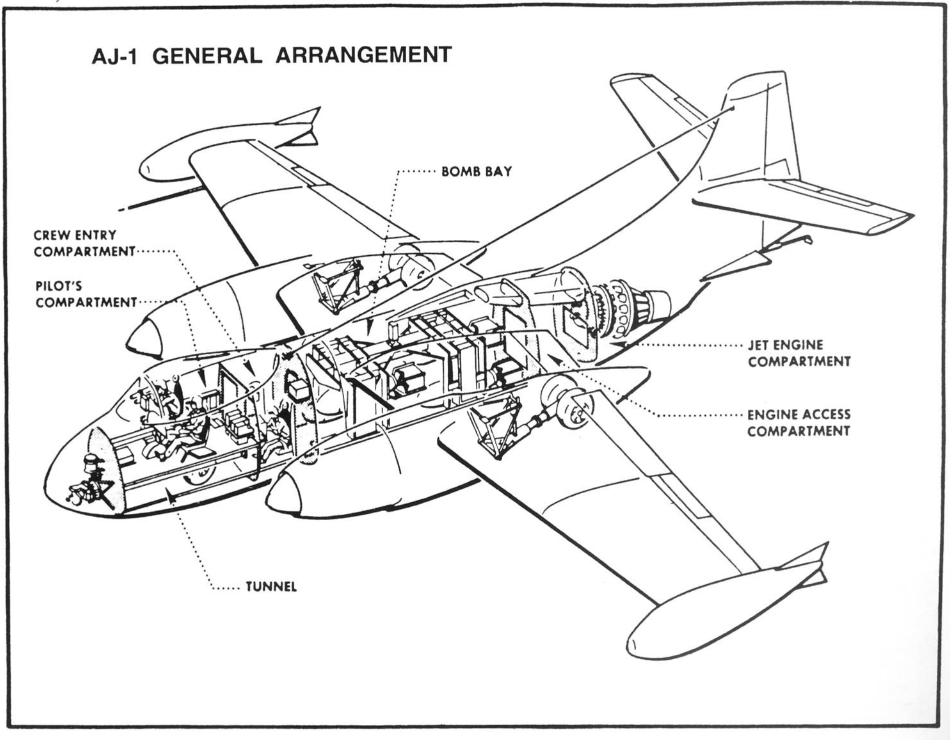
WARNING

Bomb doors closed for escape through crew exit door.

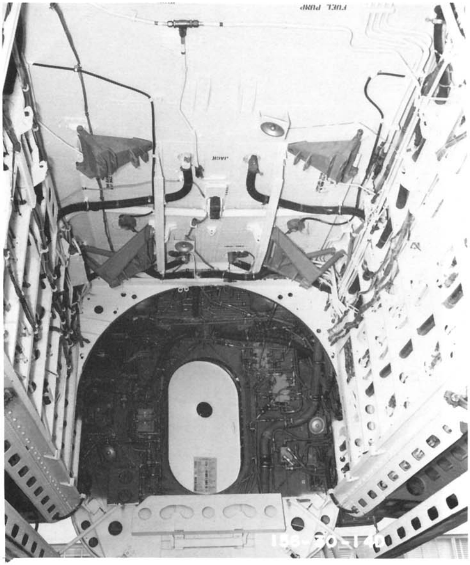


All crew members exit through crew exit door. (Alternate exit through bomb doors; cabin must be depressurized before hatch to bomb bay can be opened.)



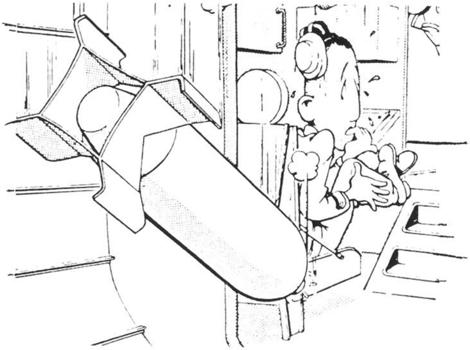


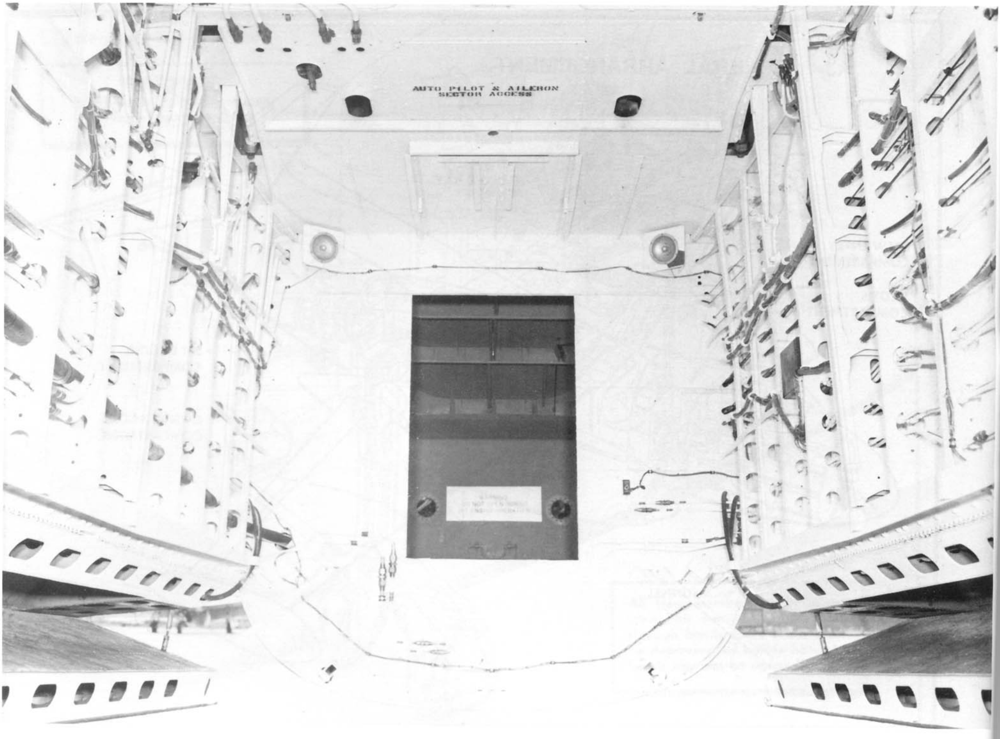
AJ-1 GENERAL ARRANGEMENT



BOMB BAY

At left, the Savage bomb bay looking forward. The oval door is the crew's access from the lower crew compartment. The bomb bay does not have the bomb bay adapter installed which allows multiple conventional bombs to be carried. As shown here a single yoke "A" bomb rack would have been fitted to the four mounts in the bomb bay roof. Below, the Savage bomb bay looking aft. The dark area is the access door to the engine access compartment.





BOMB BAY ADAPTER

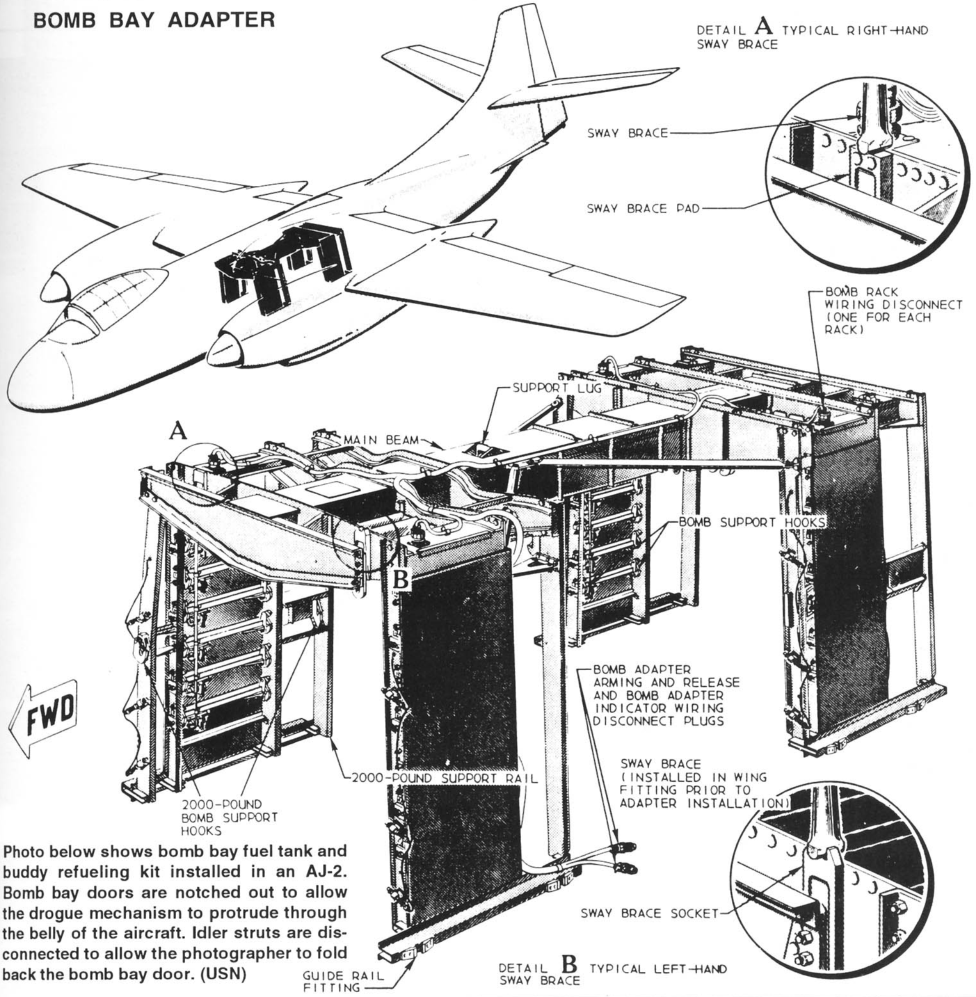
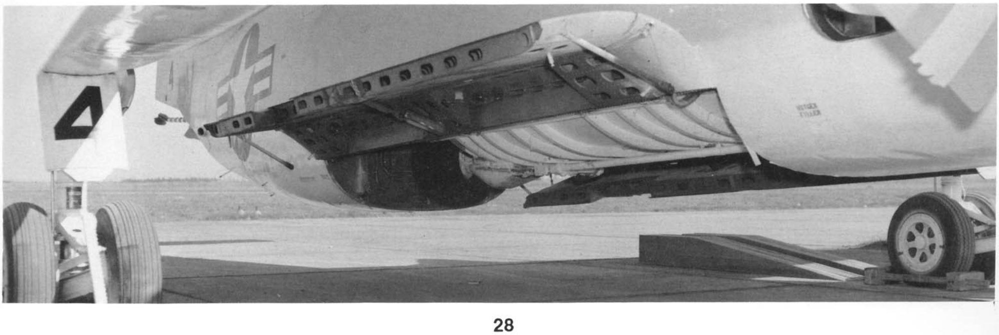
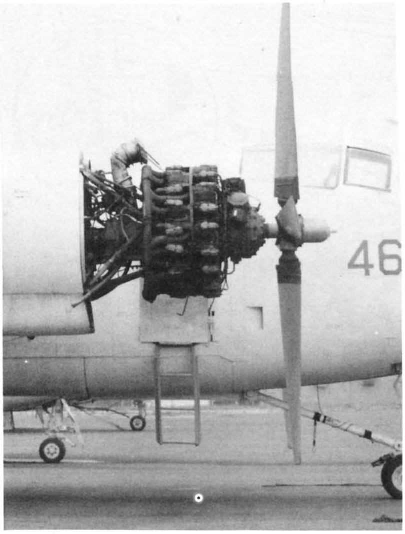
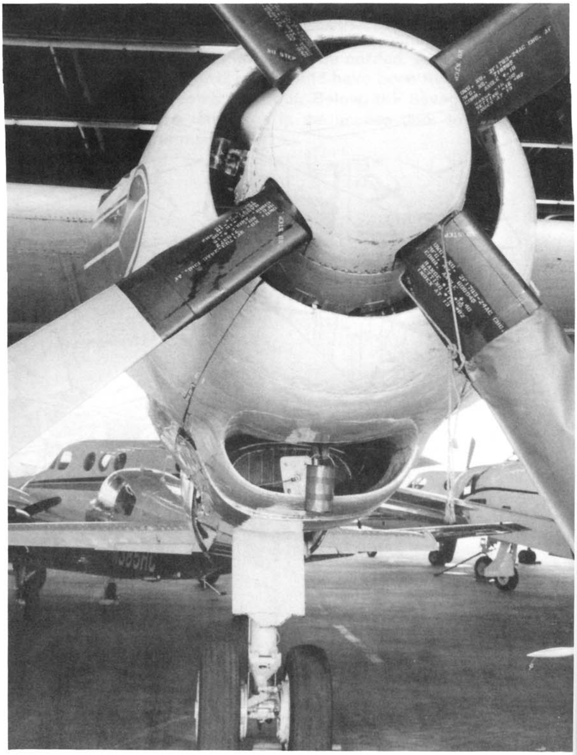

DETAIL A TYPICAL RIGHT-HAND SWAY BRACE
SWAY BRACE
SWAY BRACE PAD
BOMB RACK WIRING DISCONNECT (ONE FOR EACH RACK)
SUPPORT LUG
A
MAIN BEAM
BOMB SUPPORT HOOKS
B
FWD
BOMB ADAPTER ARMING AND RELEASE AND BOMB ADAPTER INDICATOR WIRING DISCONNECT PLUGS
2000-POUND SUPPORT RAIL
2000-POUND BOMB SUPPORT HOOKS
SWAY BRACE (INSTALLED IN WING FITTING PRIOR TO ADAPTER INSTALLATION)
SWAY BRACE SOCKET
GUIDE RAIL FITTING
DETAIL B TYPICAL LEFT-HAND SWAY BRACE

Photo below shows bomb bay fuel tank and buddy refueling kit installed in an AJ-2. Bomb bay doors are notched out to allow the drogue mechanism to protrude through the belly of the aircraft. Idler struts are disconnected to allow the photographer to fold back the bomb bay door. (USN)

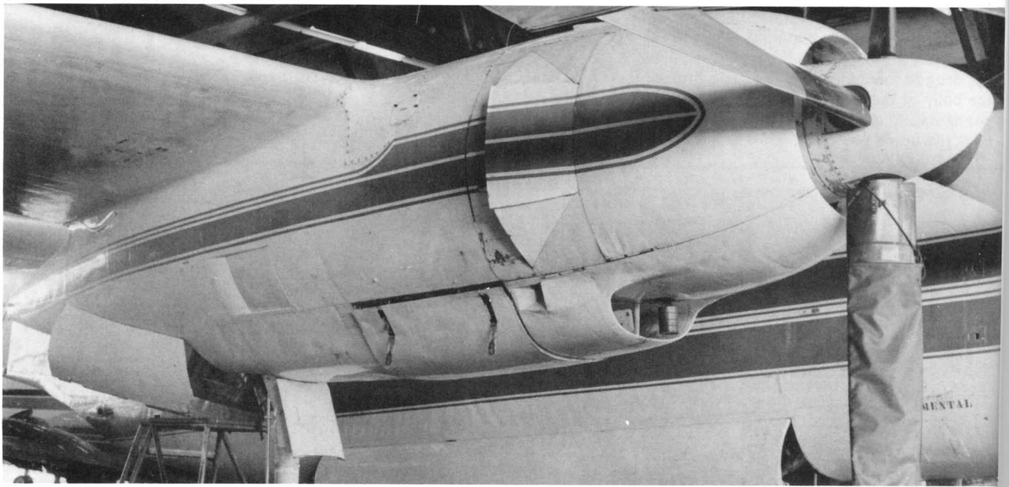


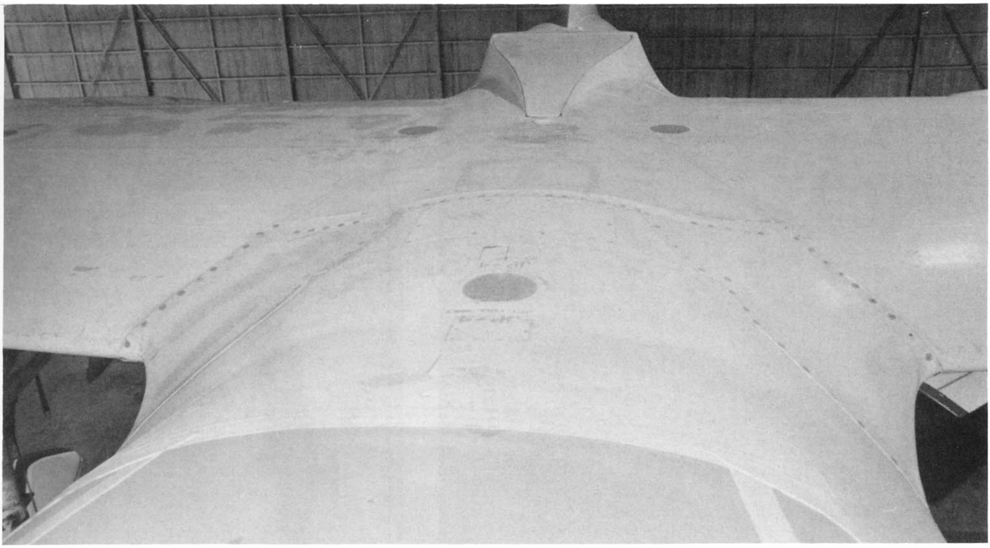
POWERPLANTS: "TWO TURNING AND ONE BURNING"





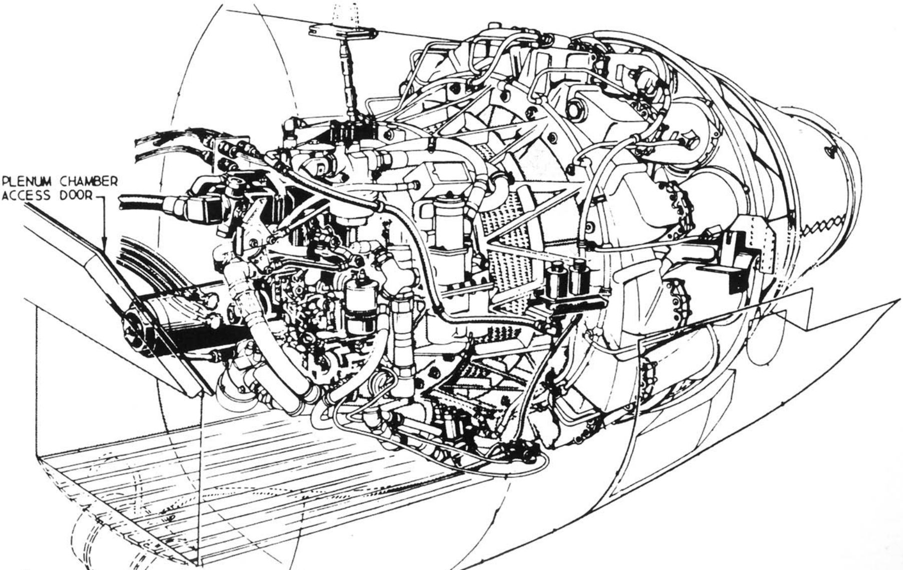
Above, R-2800 minus cowls on XAJ-1. (Robert Esposito via Jansson) At right and below, engine nacelle of the Lycoming AJ-2 which now resides at the Naval Aviation Museum, Pensacola, Florida. Cowl flaps are in the full open position and a drip can is hanging in front of the oil cooler air intake (Eddy Mellina)

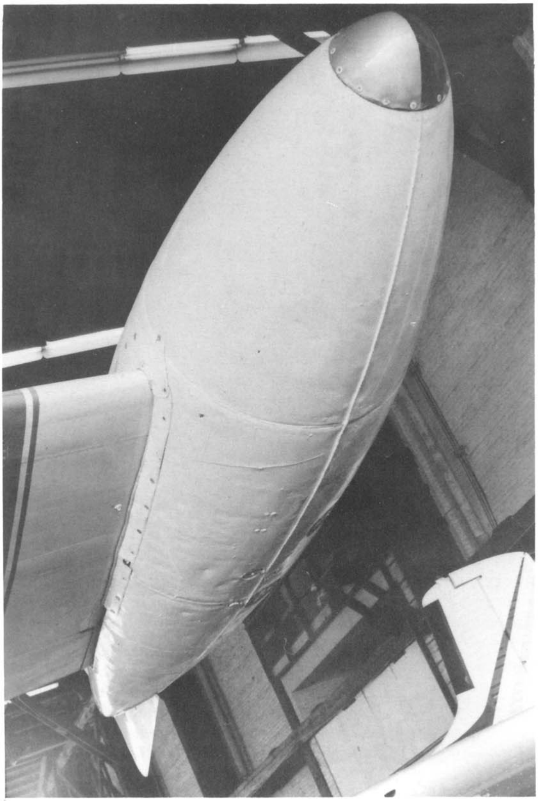


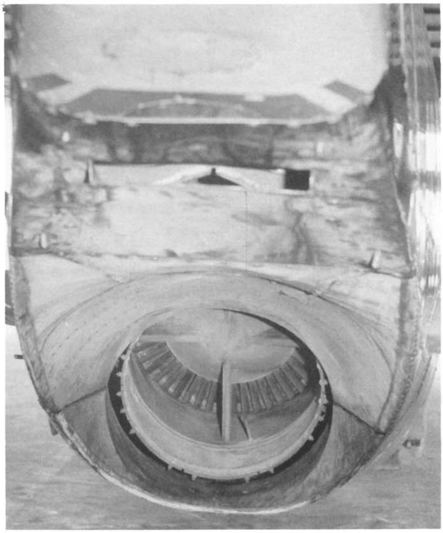


J-33 ENGINE INSTALLATION

Above, view of J-33 jet engine intake taken from the rear emergency escape hatch of an AJ-2. Intake door is hinged at the front and drops down during engine operation to form the bottom of the engine intake. (Eddy Mellina)



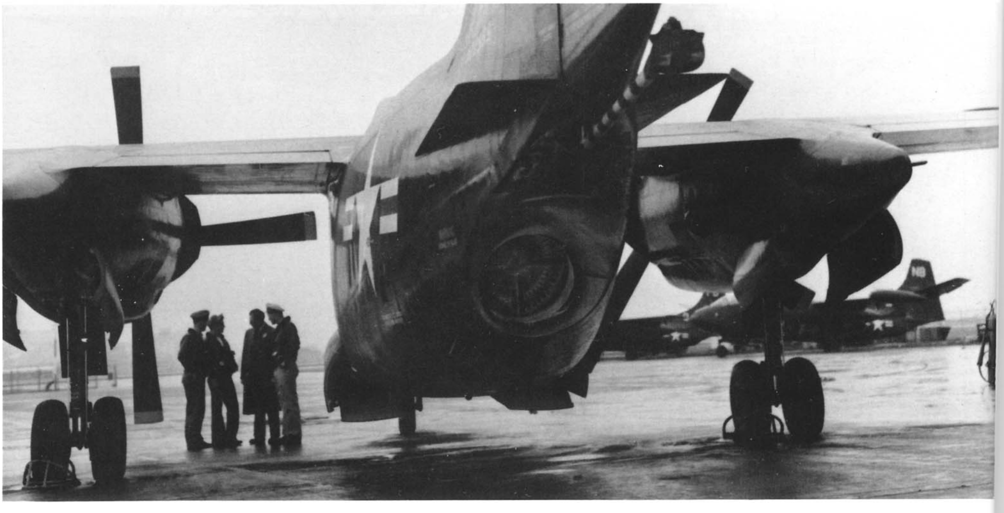




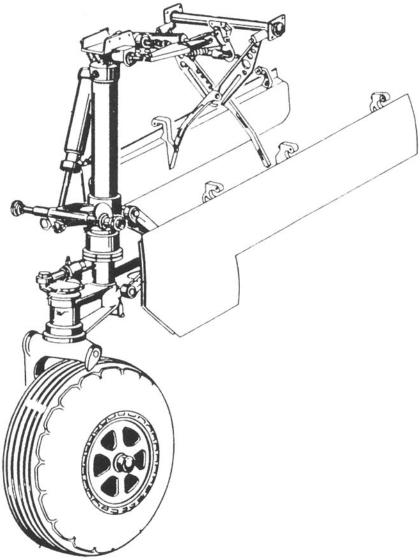
At left, 520 gallon tip tank detail. (Eddy Mellina)

Above, close-up of J-33 exhaust in an AJ-2. (Eddy Mellina)

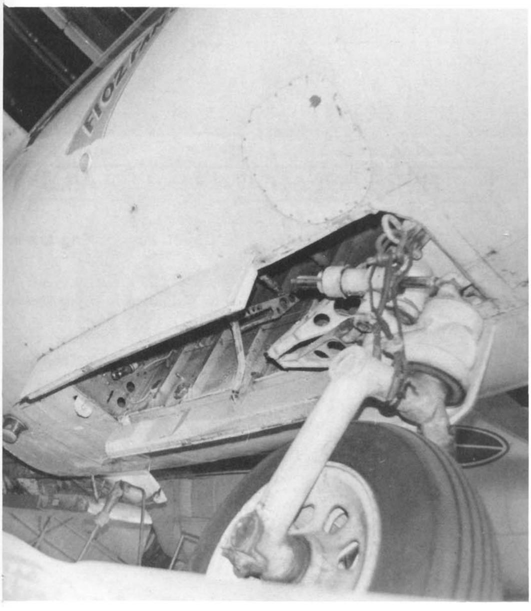
Below, AJ-1 J-33 exhaust. Notice the size and shape of the fuselage strakes. (National Archives)

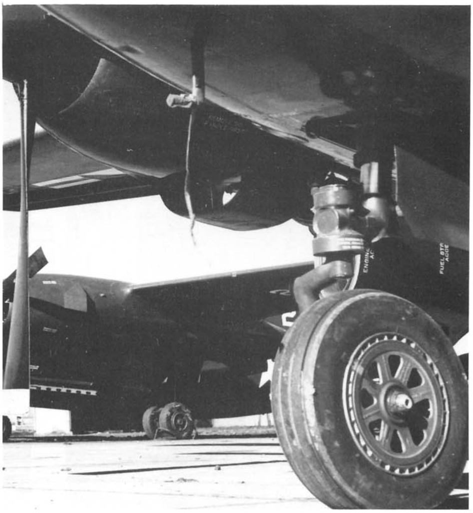


NOSE GEAR DETAILS

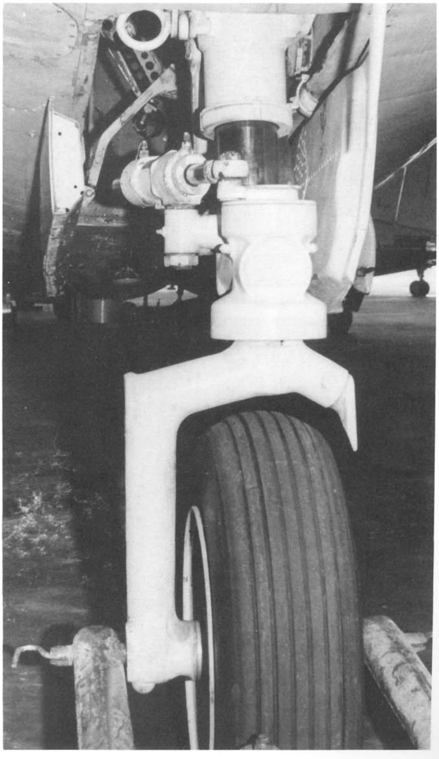


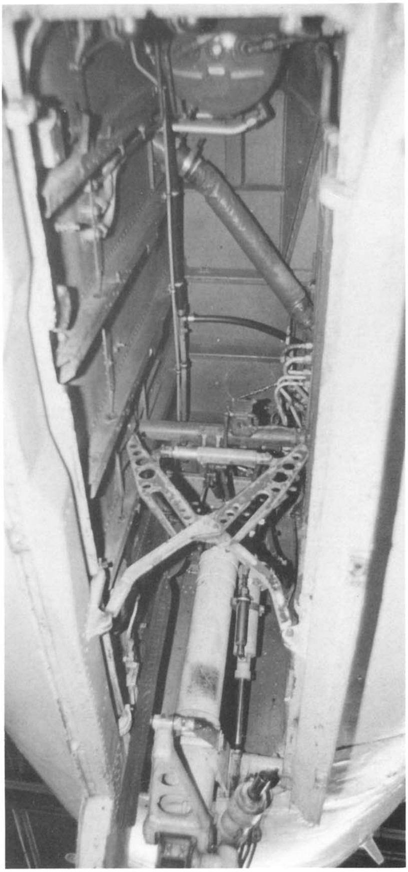
Two views of a AJ-2 nose gear from the front. (Eddy Mellina)

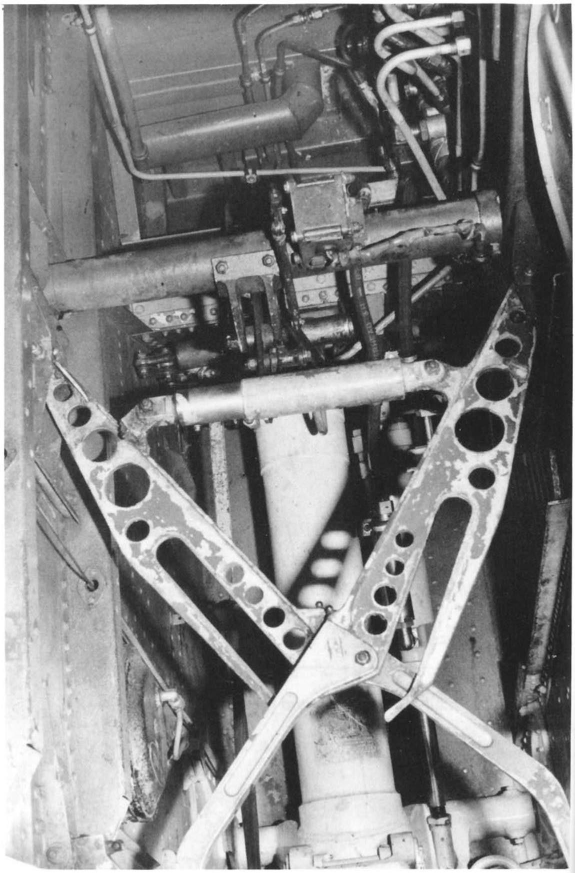


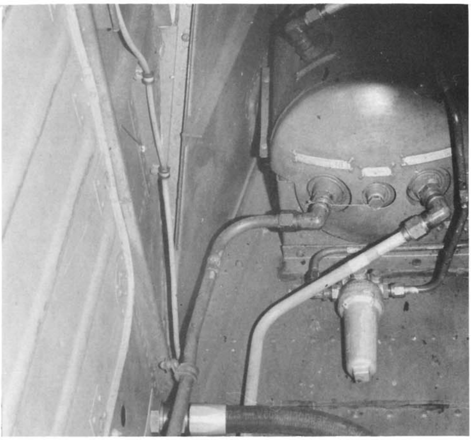


Above, nose gear on a AJ-1. (National Archives)









NOSE GEAR WELL DETAILS

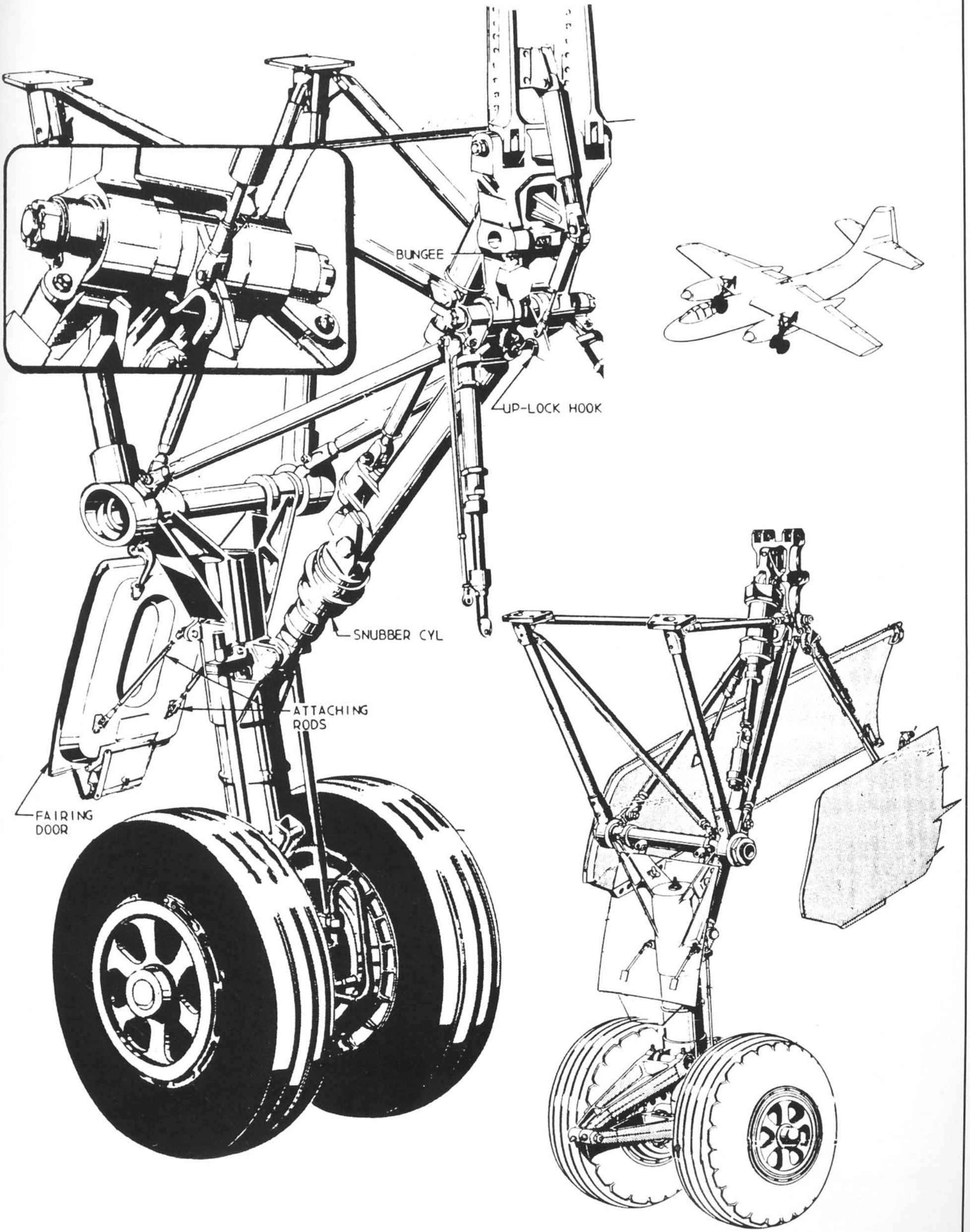
Above left, interior of nose gear wheel well looking forward. (Eddy Mellina)

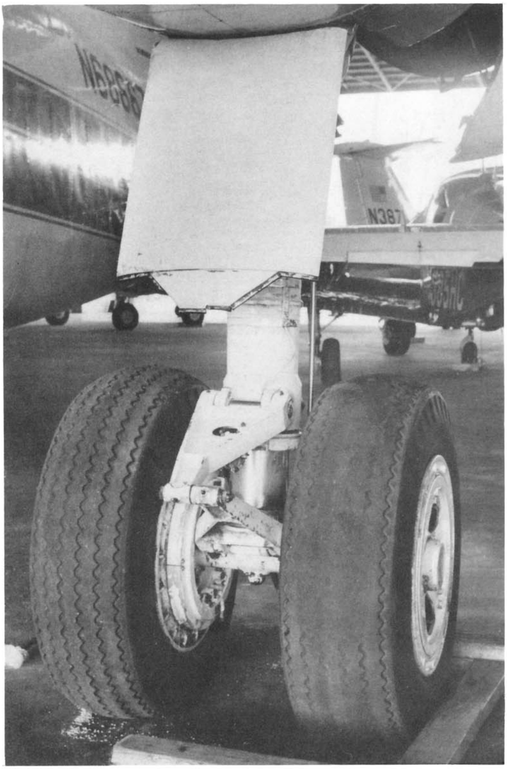
Above, close-up of nose gear door scissors looking forward. (Eddy Mellina)

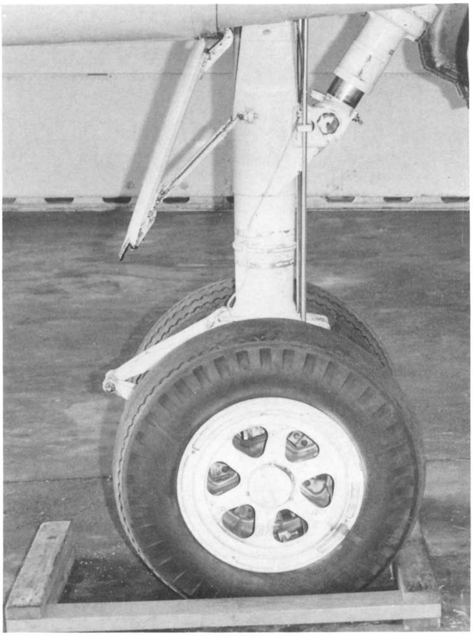
At left, rear nose gear wheel well wall detail. (Eddy Mellina)

AJ *Savage*

MAIN LANDING GEAR DETAILS

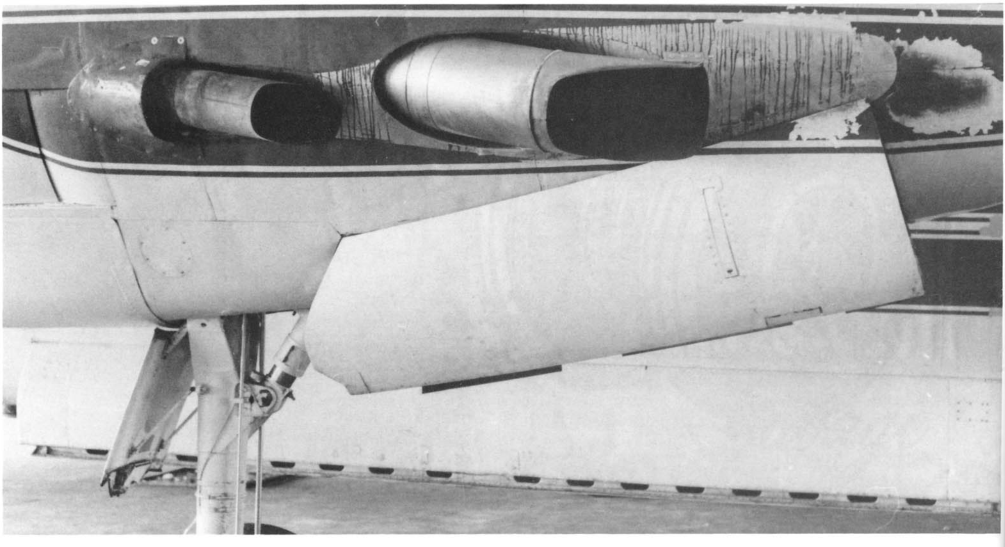


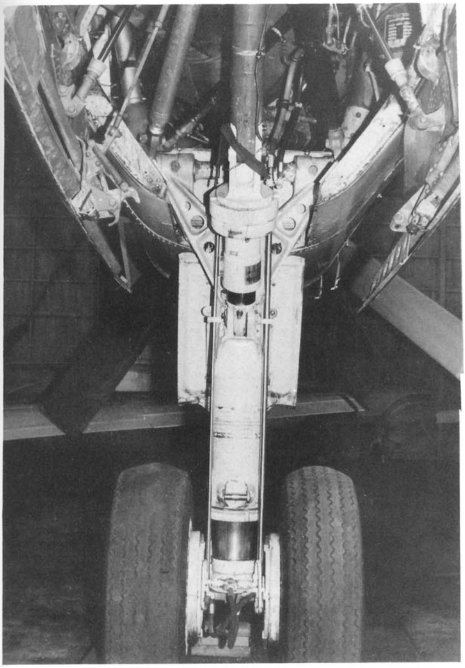


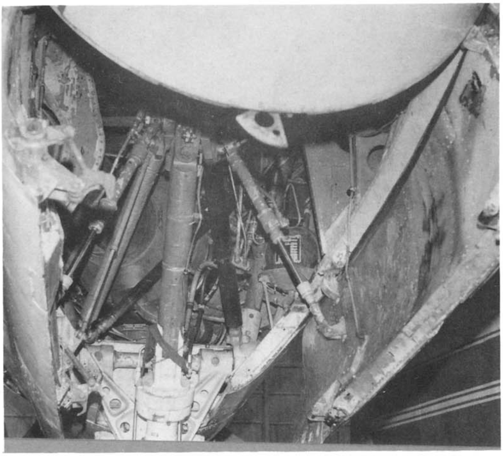


MAIN LANDING GEAR DETAILS

At left, AJ-2 main gear looking aft. Above, side view of AJ-2 main gear. Below, R-2800 exhaust stacks and main gear door details. (Eddy Mellina)

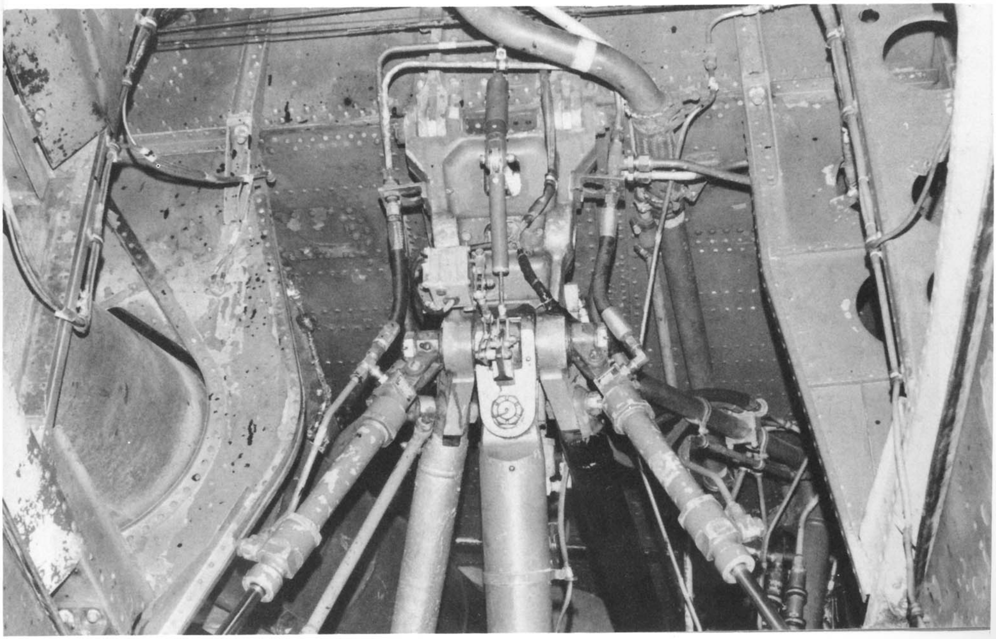


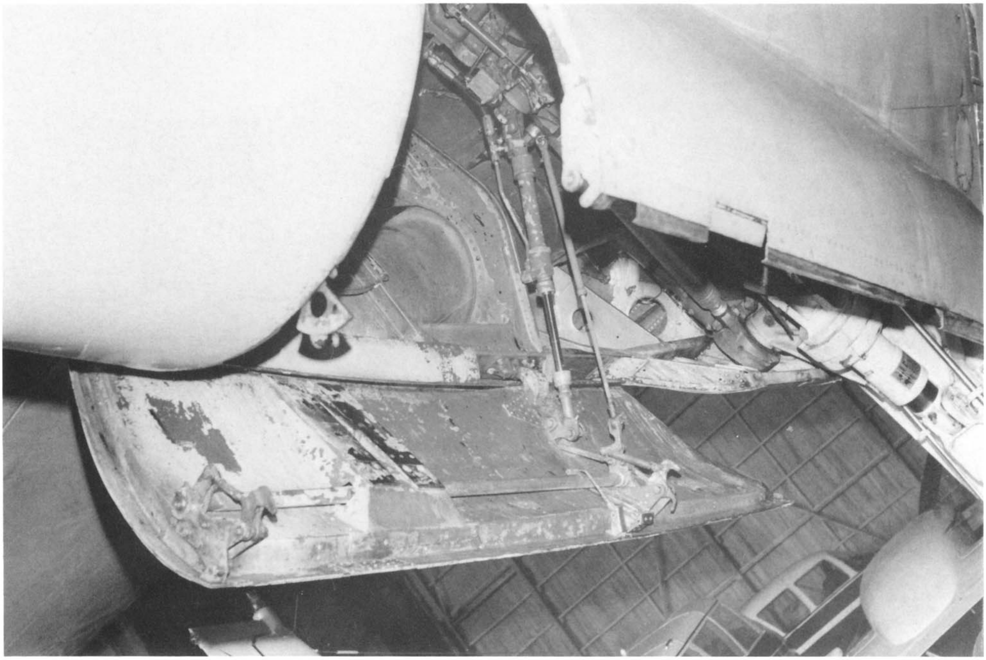




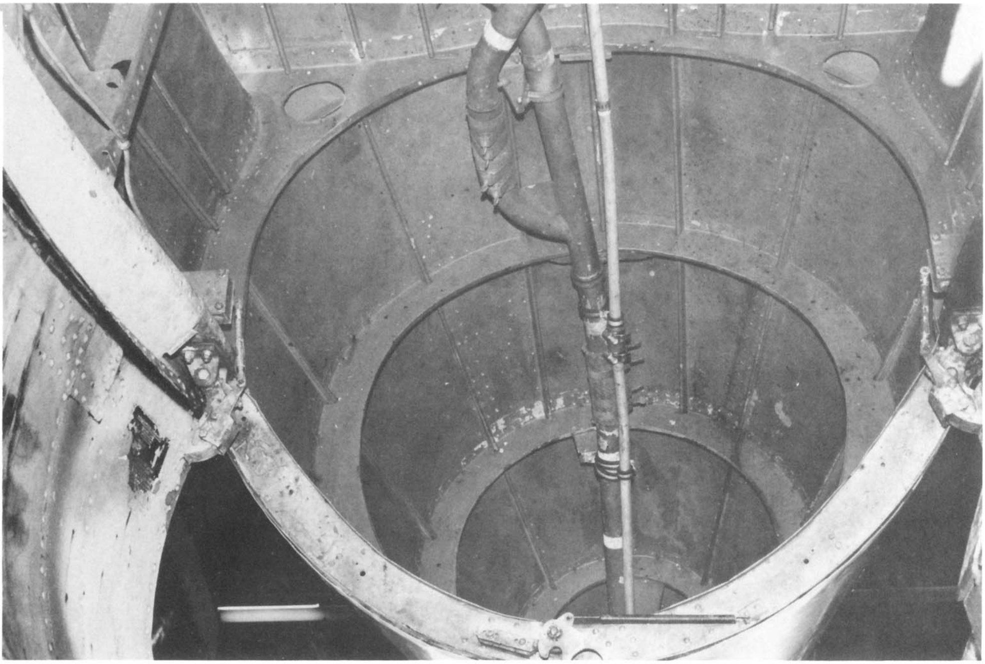
MAIN LANDING GEAR DETAILS

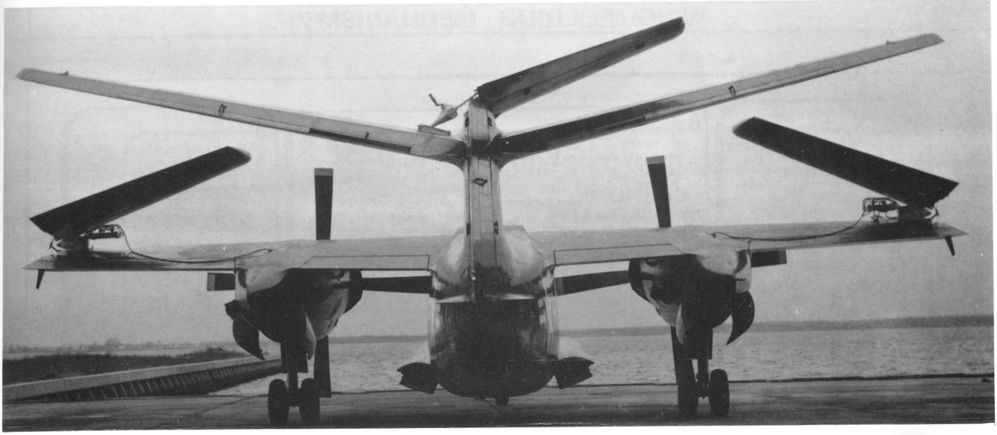
Left main landing gear looking forward. (Eddy Mellina)





Above, left main gear's left hand gear door showing the gear door locking mechanism. (Eddy Mellina) Below, looking aft into the hollow engine nacelle with fuel dump lines routed across the top of the nacelle. (Eddy Mellina)





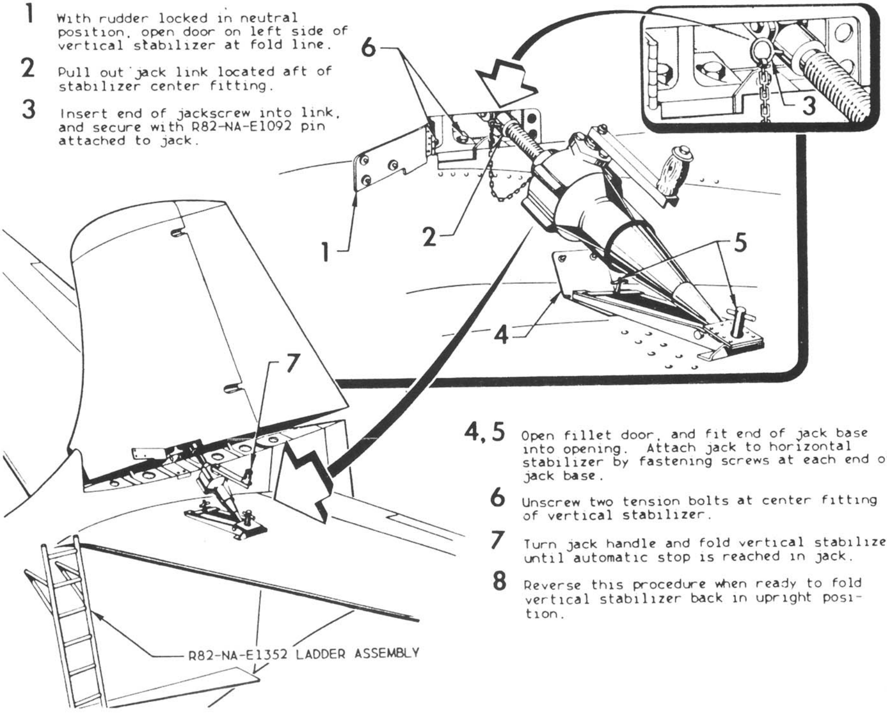
AJ-1 122597 at NAS Patuxent River on 12-14-49 with tail and wing folding mechanisms attached. (National Archives)

VERTICAL TAIL FOLDING

1 With rudder locked in neutral position, open door on left side of vertical stabilizer at fold line.

2 Pull out jack link located aft of stabilizer center fitting.

3 Insert end of jackscrew into link, and secure with R82-NA-E1092 pin attached to jack.



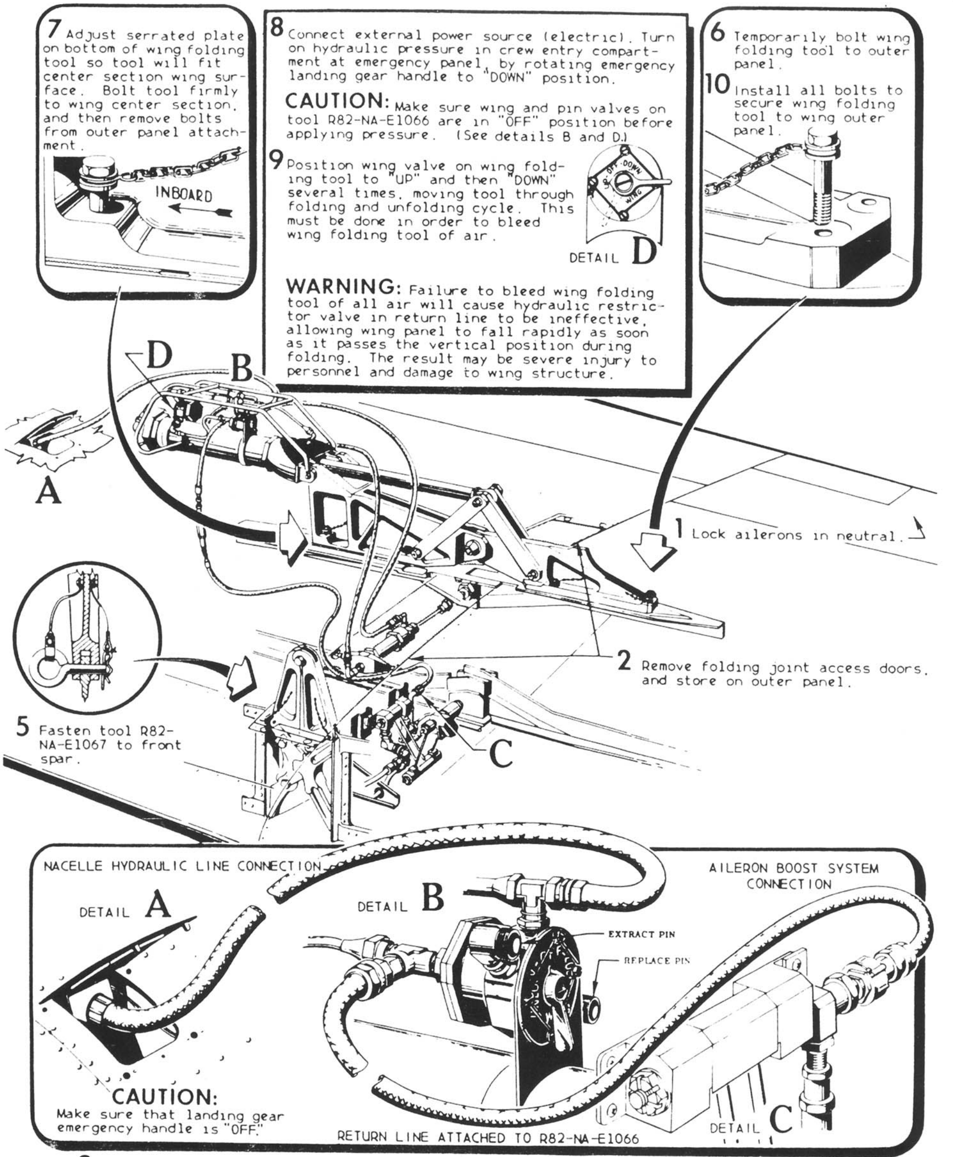
4, 5 Open fillet door, and fit end of jack base into opening. Attach jack to horizontal stabilizer by fastening screws at each end of jack base.

6 Unscrew two tension bolts at center fitting of vertical stabilizer.

7 Turn jack handle and fold vertical stabilizer until automatic stop is reached in jack.

8 Reverse this procedure when ready to fold vertical stabilizer back in upright position.

WING FOLDING MECHANISM



7 Adjust serrated plate on bottom of wing folding tool so tool will fit center section wing surface. Bolt tool firmly to wing center section, and then remove bolts from outer panel attachment.

8 Connect external power source (electric). Turn on hydraulic pressure in crew entry compartment at emergency panel, by rotating emergency landing gear handle to "DOWN" position.

CAUTION: Make sure wing and pin valves on tool R82-NA-E1066 are in "OFF" position before applying pressure. (See details B and D.)

9 Position wing valve on wing folding tool to "UP" and then "DOWN" several times, moving tool through folding and unfolding cycle. This must be done in order to bleed wing folding tool of air.

WARNING: Failure to bleed wing folding tool of all air will cause hydraulic restrictor valve in return line to be ineffective, allowing wing panel to fall rapidly as soon as it passes the vertical position during folding. The result may be severe injury to personnel and damage to wing structure.

6 Temporarily bolt wing folding tool to outer panel.

10 Install all bolts to secure wing folding tool to wing outer panel.

1 Lock ailerons in neutral.

2 Remove folding joint access doors, and store on outer panel.

5 Fasten tool R82-NA-E1067 to front spar.

NACELLE HYDRAULIC LINE CONNECTION

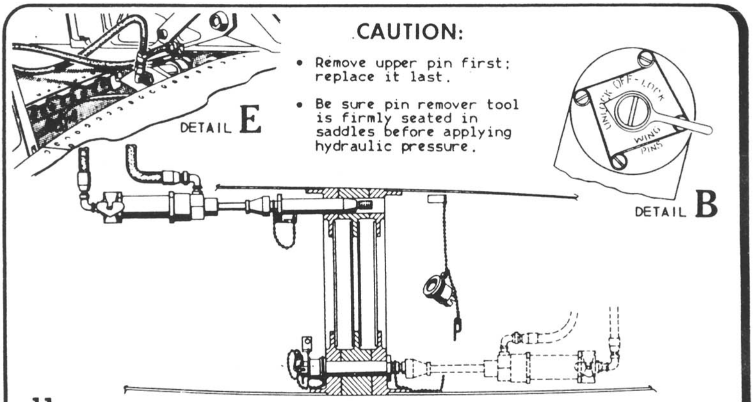
CAUTION:
Make sure that landing gear emergency handle is "OFF."

AILERON BOOST SYSTEM CONNECTION

RETURN LINE ATTACHED TO R82-NA-E1066

3 Connect hydraulic pressure line at centerline of nacelle near rear spar. (See detail A.)

4 Connect hydraulic return line from wing folding tool R82-NA-E1066 into aileron boost system return line. (See detail C.)

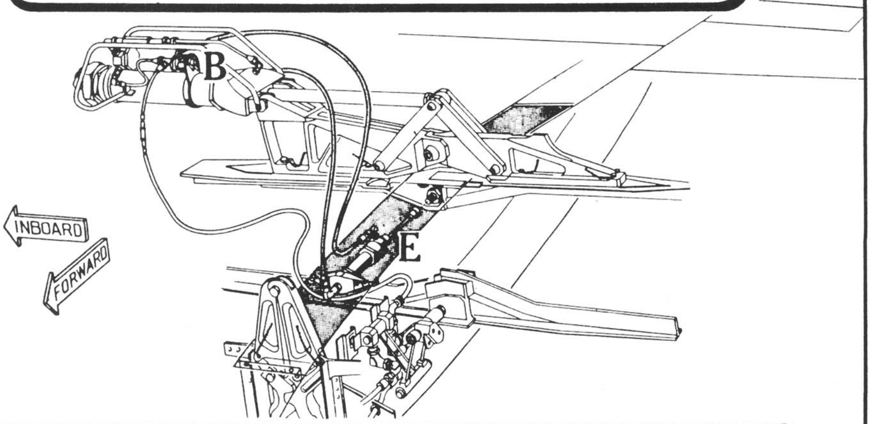


CAUTION:

- Remove upper pin first; replace it last.
- Be sure pin remover tool is firmly seated in saddles before applying hydraulic pressure.

11 Remove nuts from upper and lower pins.

12 Remove pins, using hydraulic cylinder provided. With pin valve "OFF," insert cylinder and turn pin, pulling valve to "UNLOCK." (There is only one hydraulic pin remover. Two are shown to illustrate the position of cylinder in use at each pin.)



CAUTION:

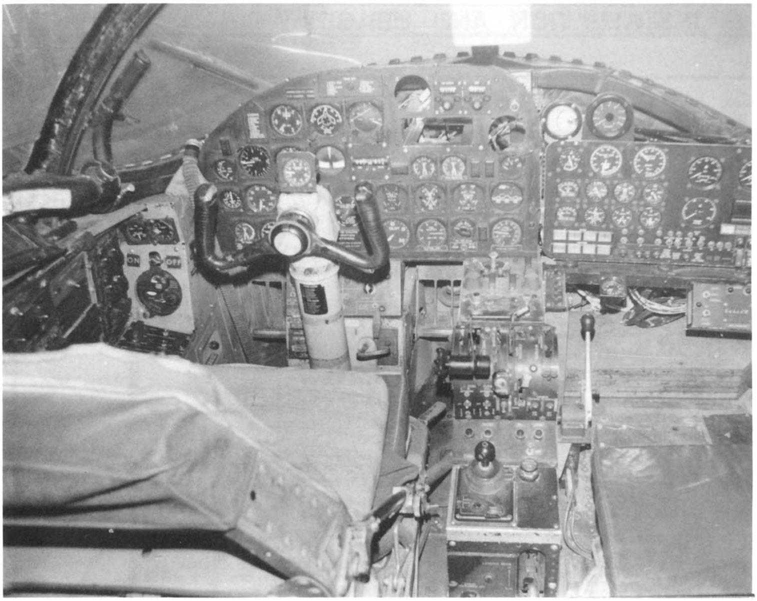
- Prior to folding left wing cage compass flux gate transmitter gyro by caging the gyro horizon, which is located in the pilot's instrument panel.
- Do not fold wings, with tip tanks installed, in winds over 30 mph. With tip tanks installed, wings should not be kept folded in winds over 40 mph.
- Do not fold wings with fuel in tip tanks.

13 Turn wing valve to "UP." When folding operation is completed, turn hydraulic pressure off, and turn wing valve to "OFF."

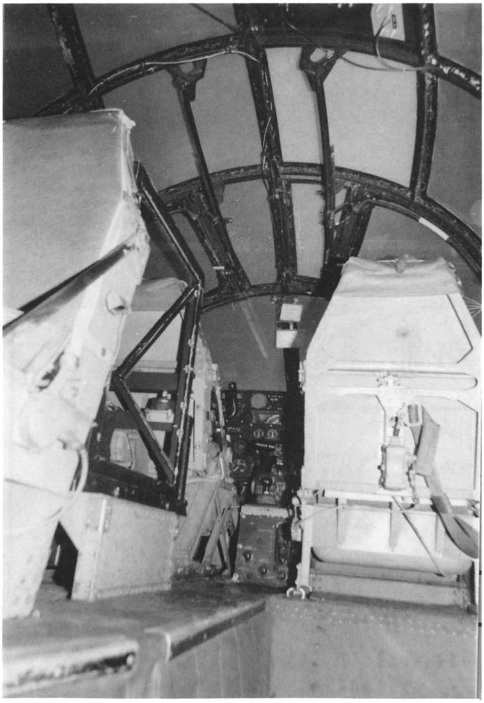
NOTE:

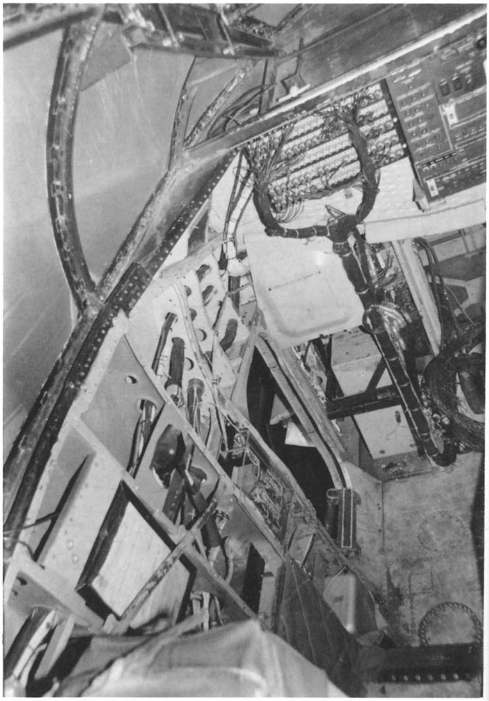
- Extension of the wing is essentially the reverse of steps 1 through 13, excluding steps 6 and 9.
- Safety harness attaching rings are provided in the upper surface of the wing, inboard of the wing folding joint. These rings should be used with suitable safety harness for protection of personnel engaged in the wing folding operation.

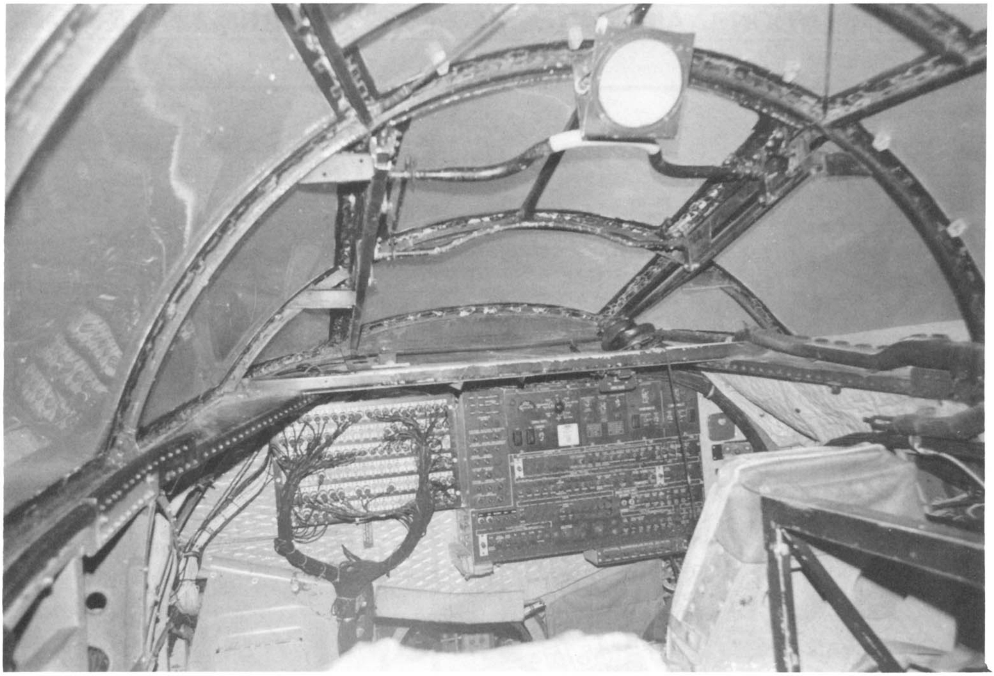
AJ-2 COCKPIT



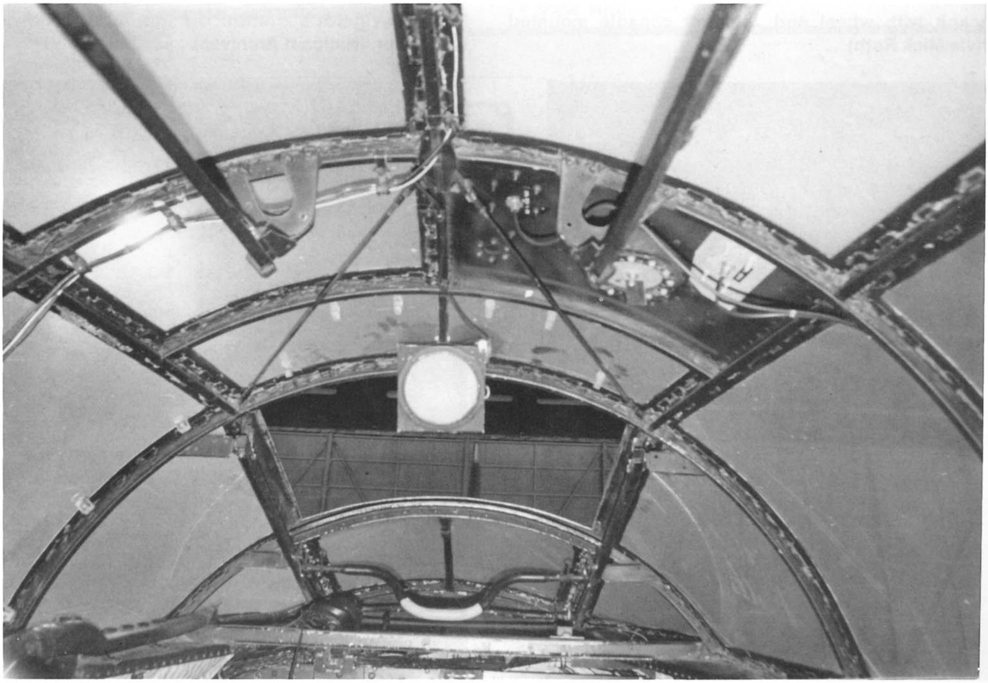
Avco Lycoming AJ-2 cockpit shows the control wheel and the center console mounted throttles which were indigenous to this model. The bomber navigator station has been removed and replaced by engine test instruments which were used on Avco Lycoming projects. Below left, looking forward toward the instrument panel while standing in the lower crew entrance door. Note the frame stringers on which the two forward escape windows slide back. The third crewman's seat is on the left. Below right, looking aft and down into the crew entrance area with the door open. (all photos by Eddy Mellina)



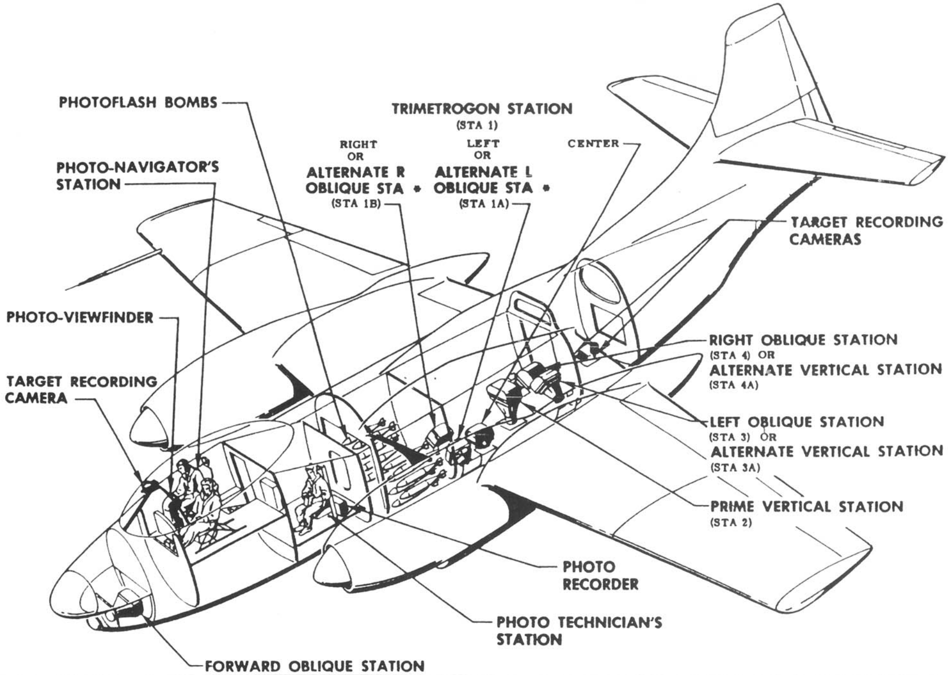




Above, AJ-2 third crewman's position facing aft with escape hatch window closed. The release handle was white. Below, the escape hatch in the open position. (Eddy Mellina)



CAMERA STATIONS, AIRPLANES 128043-128054 AND 129185-129189



AJ-2P cockpit with wheel and with left console mounted throttles. (via Mick Roth)

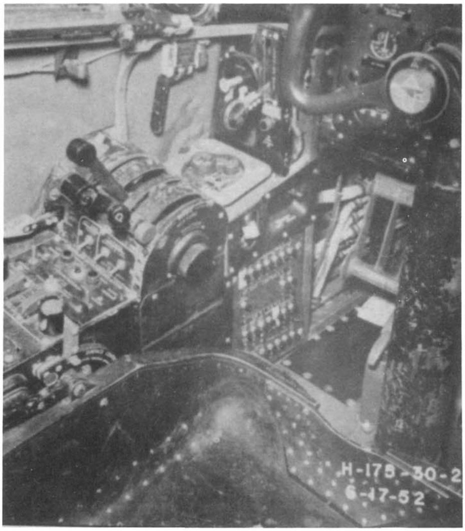


Photo-navigator's station on the AJ-2P showing the viewfinder. (National Archives)

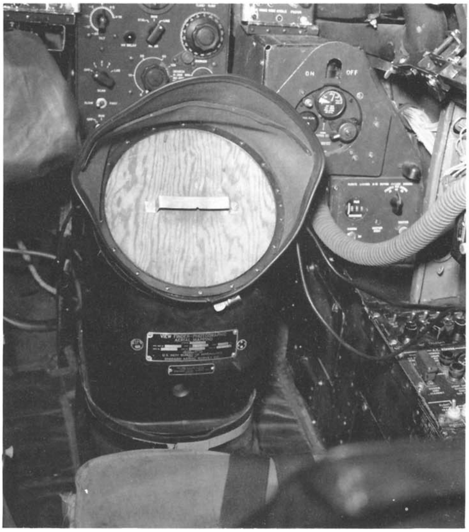
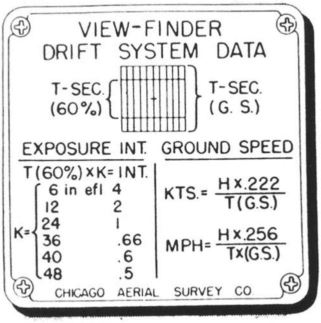
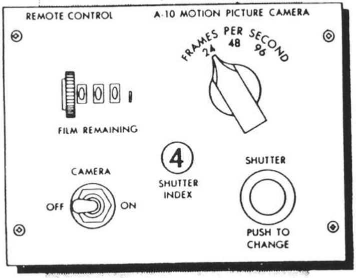


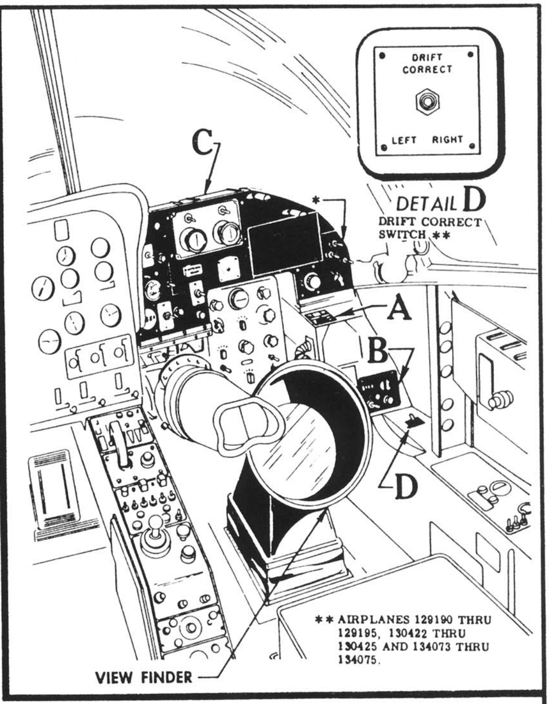
PHOTO-NAVIGATOR STATION, EQUIPMENT AND CONTROLS



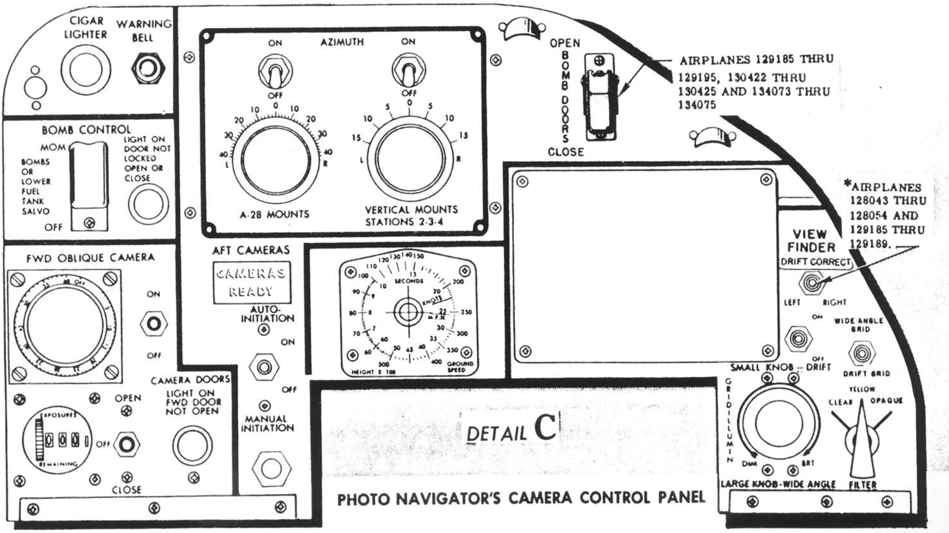
DETAIL A



DETAIL B



** AIRPLANES 129190 THRU 129195, 130422 THRU 130425 AND 134073 THRU 134075.



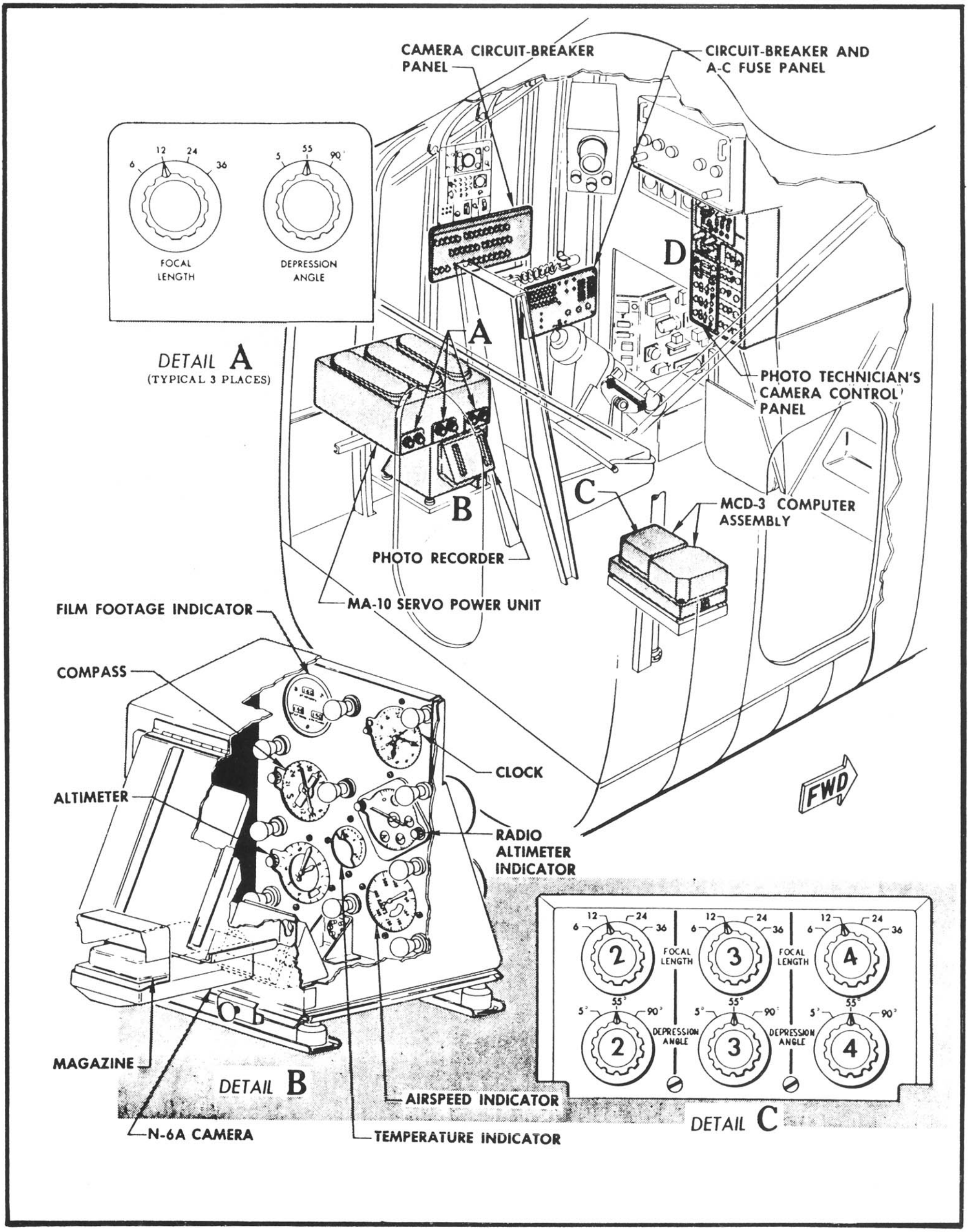
AIRPLANES 129185 THRU 129195, 130422 THRU 130425 AND 134073 THRU 134075

*AIRPLANES 128043 THRU 128054 AND 129185 THRU 129189.

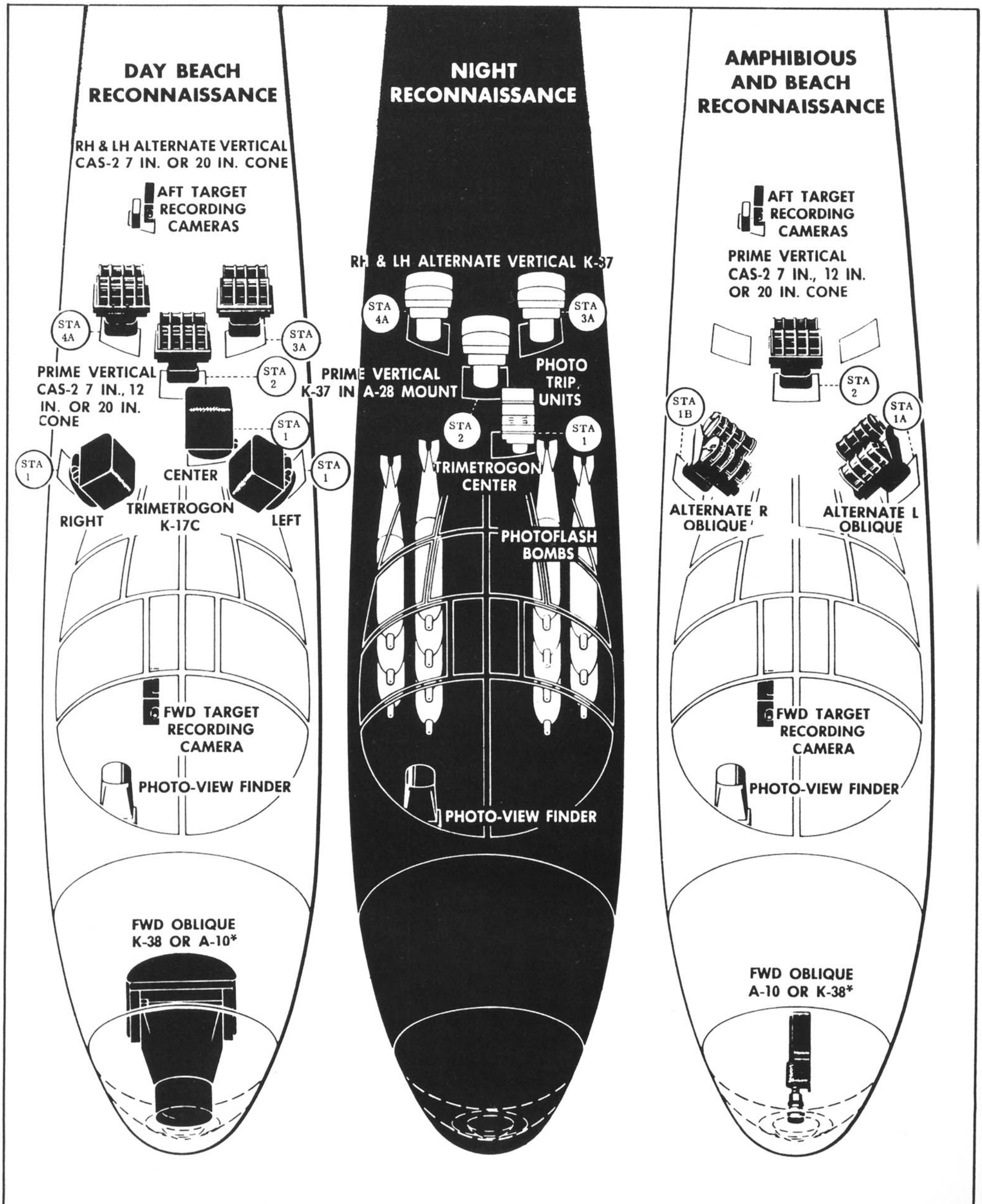
DETAIL C

PHOTO NAVIGATOR'S CAMERA CONTROL PANEL

PHOTO-TECHNICIAN STATION, AIRPLANES 128043-128054 AND 129185-129189



AJ-2P CAMERA ARRANGEMENT


DAY BEACH RECONNAISSANCE
RH & LH ALTERNATE VERTICAL CAS-2 7 IN. OR 20 IN. CONE
AFT TARGET RECORDING CAMERAS
STA 4A
STA 3A
STA 2
PRIME VERTICAL CAS-2 7 IN., 12 IN. OR 20 IN. CONE
STA 1
STA 1
STA 1
CENTER
RIGHT
TRIMETROGON K-17C
LEFT
FWD TARGET RECORDING CAMERA
PHOTO-VIEW FINDER
FWD OBLIQUE K-38 OR A-10*
NIGHT RECONNAISSANCE
RH & LH ALTERNATE VERTICAL K-37
STA 4A
STA 3A
PRIME VERTICAL K-37 IN A-28 MOUNT
PHOTO TRIP UNITS
STA 2
STA 1
TRIMETROGON CENTER
PHOTOFLASH BOMBS
PHOTO-VIEW FINDER
AMPHIBIOUS AND BEACH RECONNAISSANCE
AFT TARGET RECORDING CAMERAS
PRIME VERTICAL CAS-2 7 IN., 12 IN. OR 20 IN. CONE
STA 2
STA 1B
STA 1A
ALTERNATE R OBLIQUE
ALTERNATE L OBLIQUE
FWD TARGET RECORDING CAMERA
PHOTO-VIEW FINDER
FWD OBLIQUE A-10 OR K-38*

*ALTERNATE CAMERA USED

FORWARD OBLIQUE CAMERA STATION

INSTALLING CAMERA MOUNT AT FORWARD OBLIQUE CAMERA STATION

1 Open camera compartment hood.*

2 Install four vibration isolation mounts on camera mount trunnions.

3 Position mount in hood, align vibration isolation mounts and shims with mount in hood structure, and install attaching screws.

INSTALLING K-38 CAMERA AND A-8B MAGAZINE

4 Install K-38 camera cone support on mount assembly, using integral wing nuts.

5 Install four trunnions in camera.

6 Open lens cone clamp.

7 Position camera on mount and secure lens cone clamp.

8 Install camera yoke assembly and secure with attaching bolts.

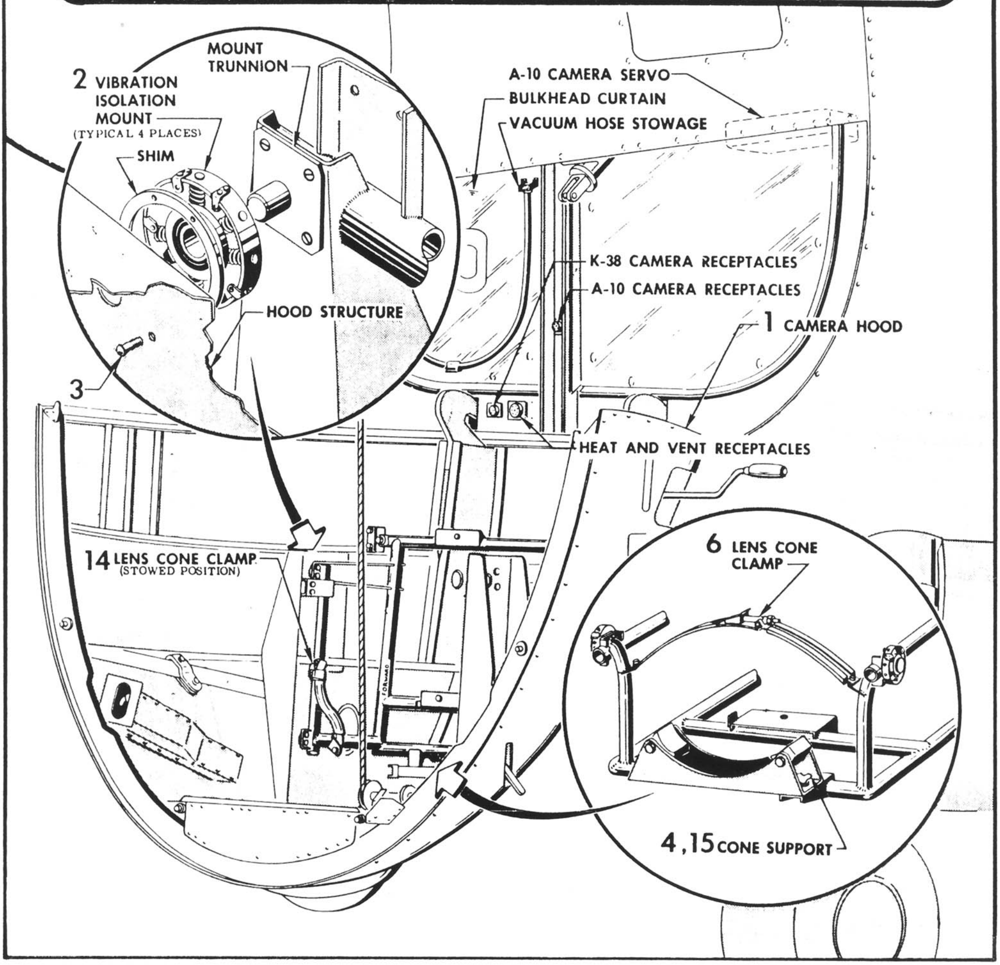
9 Install magazine on camera.*

10,11 Connect electrical cables to camera and magazine.**

CAUTION: When installing electrical cable to camera, route cable under the camera heater.

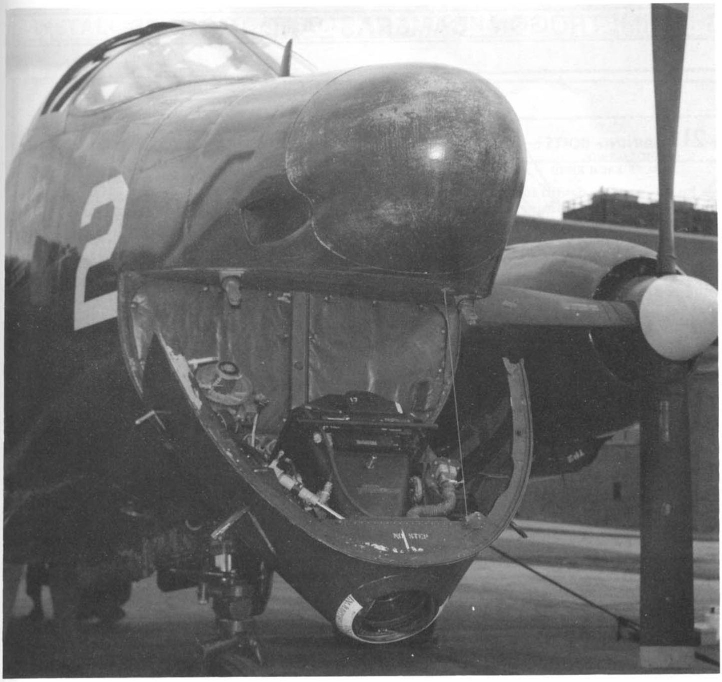
12 Connect vacuum hose (stowed on curtain aft of camera) from magazine to vacuum solenoid valve.

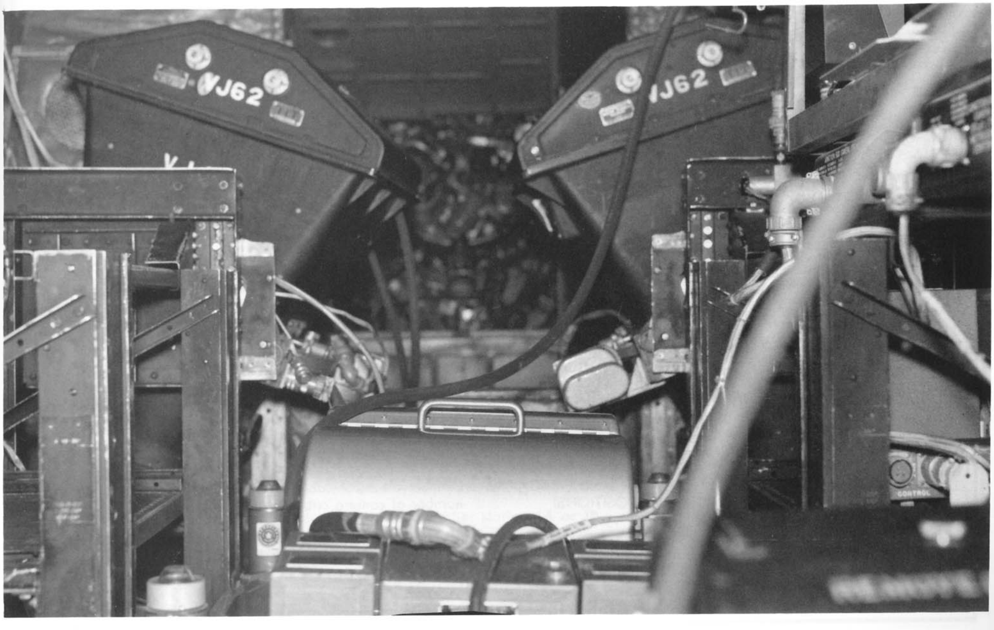
13 Close camera hood.



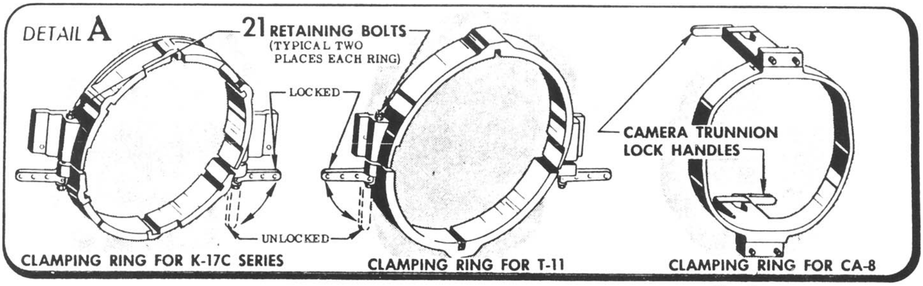
AJ-2P DETAILS

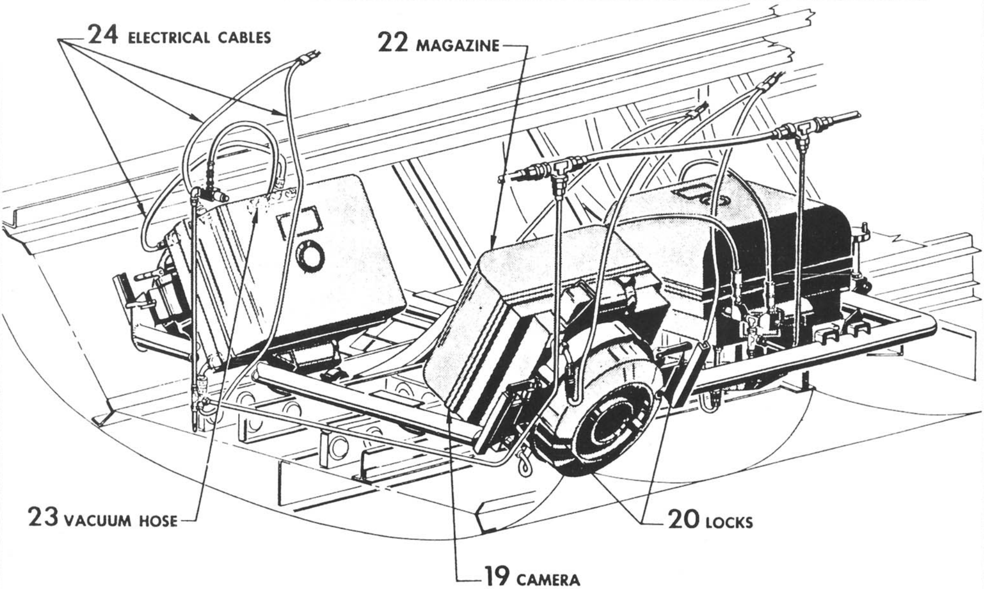
At left, 1953 photo of an AJ-2P forward oblique camera station in the open servicing position with a K-38 camera fitted. The bottom 3/4 of the camera lens housing on the exterior of the aircraft was painted white. Below, interior view looking aft of the two K-37 cameras mounted in the lower oblique camera windows, stations 3A and 4A, see previous page. (National Archives)





INSTALLING TRIMETROGON CAMERAS AND MOUNTS


DETAIL A
21 RETAINING BOLTS
(TYPICAL TWO PLACES EACH RING)
LOCKED
UNLOCKED
CAMERA TRUNNION LOCK HANDLES
CLAMPING RING FOR K-17C SERIES
CLAMPING RING FOR T-11
CLAMPING RING FOR CA-8



15, 16 Turn flight adjustment screw until machined surfaces of the vertical clamping ring are level.

17, 18 Install pointer and protractor with pointer set at "0."

INSTALLING "K" SERIES CAMERA AND MAGAZINE (TYPICAL FOR ALL THREE POSITIONS)

19-21 Install camera and secure lock handle. If clamping ring does not fit camera body, adjust lock handle retaining bolts. (See detail A for clamping ring.)

22 Install magazine. (Refer to index for page number of applicable magazine installation.)

23 Connect vacuum hose to magazine.

24 Connect electrical cables. (Refer to index for page number of camera cable data chart.)

NOTE: Installation of T-11 and CA-8 cameras is similar. The T-11 and CA-8 cameras have integral magazines.

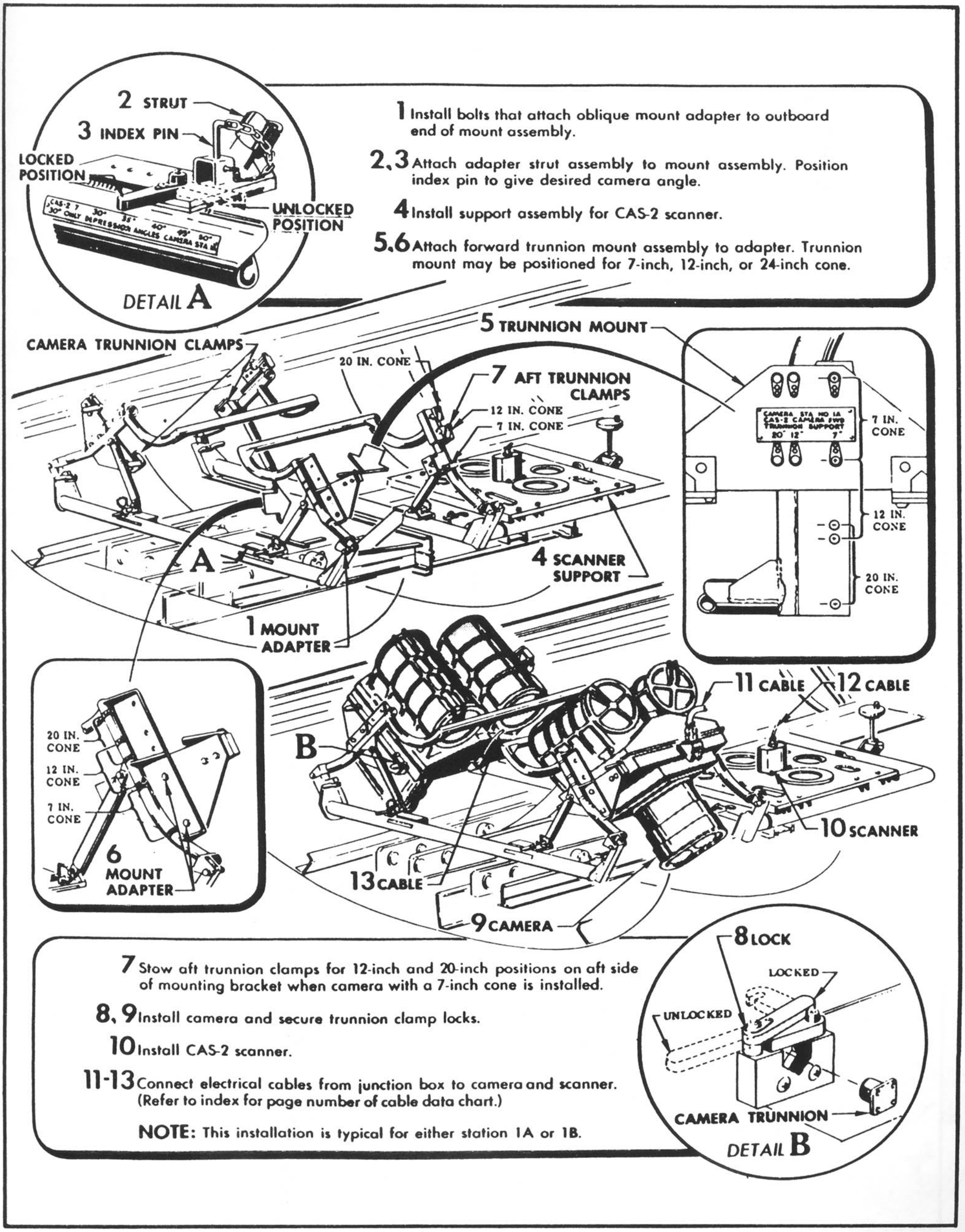
INSTALLING CAS-2 CAMERAS AT ALTERNATE LEFT AND RIGHT OBLIQUE STATIONS

1 Install bolts that attach oblique mount adapter to outboard end of mount assembly.

2, 3 Attach adapter strut assembly to mount assembly. Position index pin to give desired camera angle.

4 Install support assembly for CAS-2 scanner.

5, 6 Attach forward trunnion mount assembly to adapter. Trunnion mount may be positioned for 7-inch, 12-inch, or 24-inch cone.



7 Stow aft trunnion clamps for 12-inch and 20-inch positions on aft side of mounting bracket when camera with a 7-inch cone is installed.

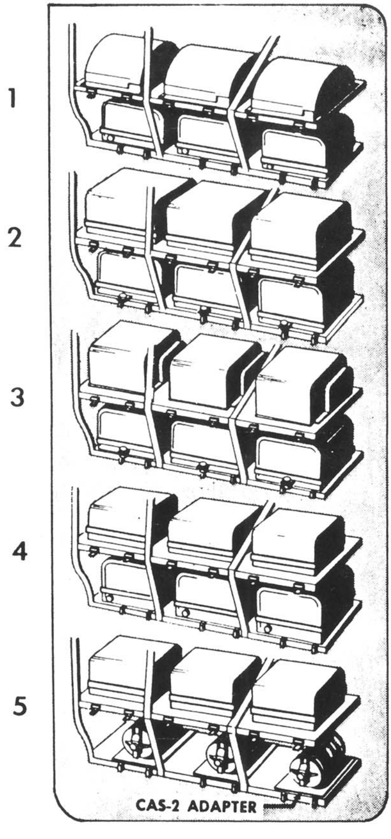
8, 9 Install camera and secure trunnion clamp locks.

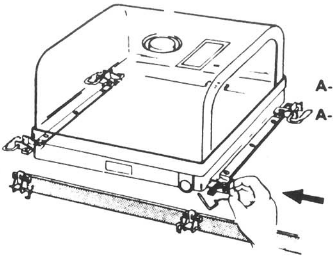
10 Install CAS-2 scanner.

11-13 Connect electrical cables from junction box to camera and scanner. (Refer to index for page number of cable data chart.)

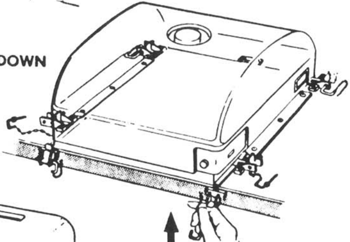
NOTE: This installation is typical for either station 1A or 1B.

CAMERA SPARE MAGAZINE PROVISIONS AND STOWAGE OPTIONS

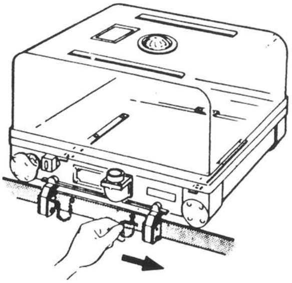




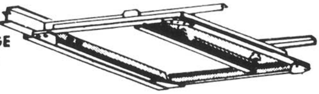
A-9A MAGAZINE HOLD-DOWN
A-5A MAGAZINE SIMILAR
(UPPER SHELF)



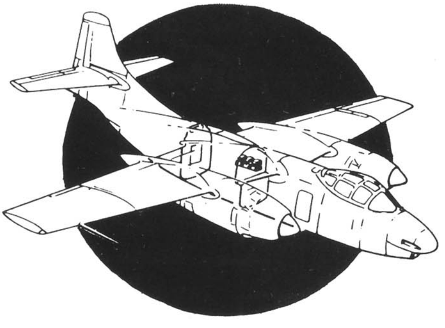
A-8B MAGAZINE HOLD-DOWN
(UPPER SHELF)



MA-10 MAGAZINE HOLD-DOWN
A-9A MAGAZINE AND
CAS-2 ADAPTER SIMILAR
(LOWER SHELF)



CAS-2 ADAPTER STOWAGE
(BOTTOM OF UPPER SHELF)



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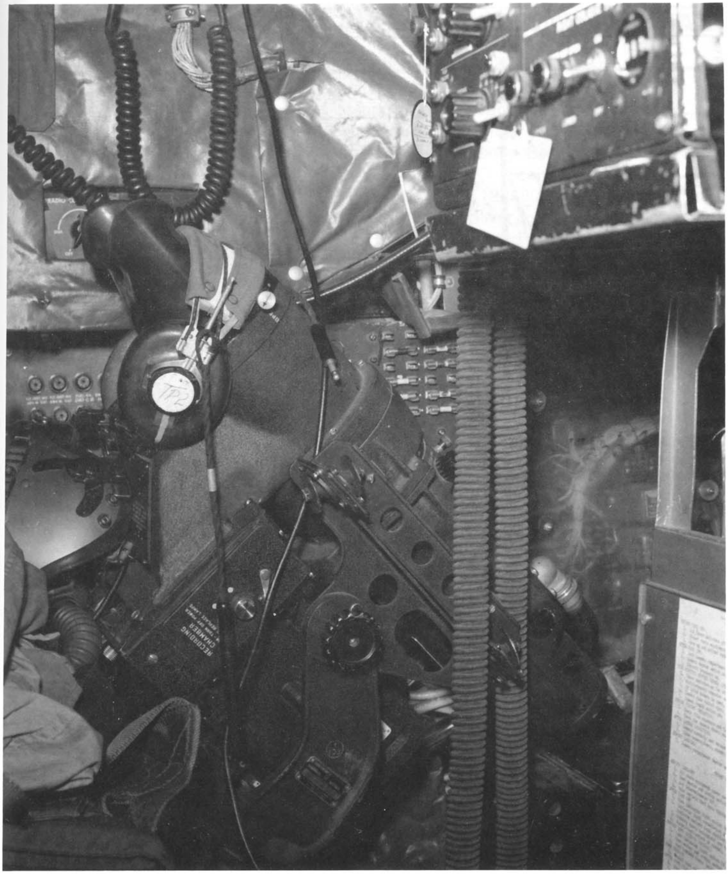
1 **COMBINATION NO. 1**
UPPER — A-8B MAGAZINE
LOWER — A-9A MAGAZINE

2 **COMBINATION NO. 2**
UPPER — A-9A MAGAZINE
LOWER — MA-10 MAGAZINE

3 **COMBINATION NO. 3**
UPPER — A-5A MAGAZINE
LOWER — MA-10 MAGAZINE

4 **COMBINATION NO. 4**
UPPER — A-9A MAGAZINE
LOWER — A-9A MAGAZINE

5 **COMBINATION NO. 5**
UPPER — A-9A MAGAZINE
LOWER — CAS-2 MAGAZINE



AJ-2P DETAILS

At left, aft target recording camera showing viewfinder, control panel, crewman's headphones, helmet, and jacket on the seat. Below left, exterior photo of right hand lower oblique window position and right hand upper oblique camera window. See drawing on the next page for location of left hand upper oblique camera window. (National Archives)

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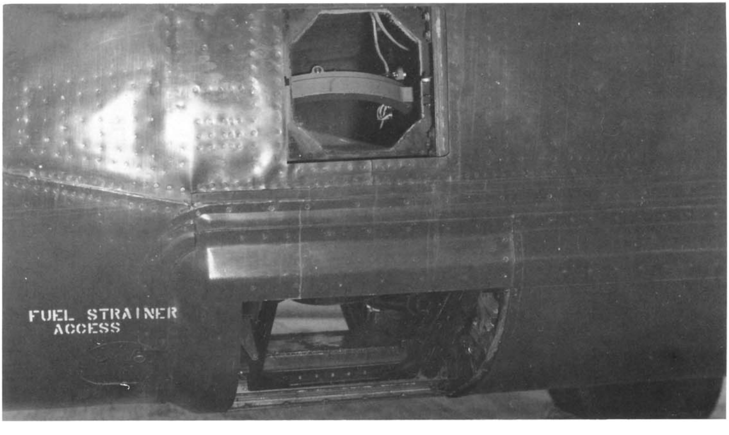
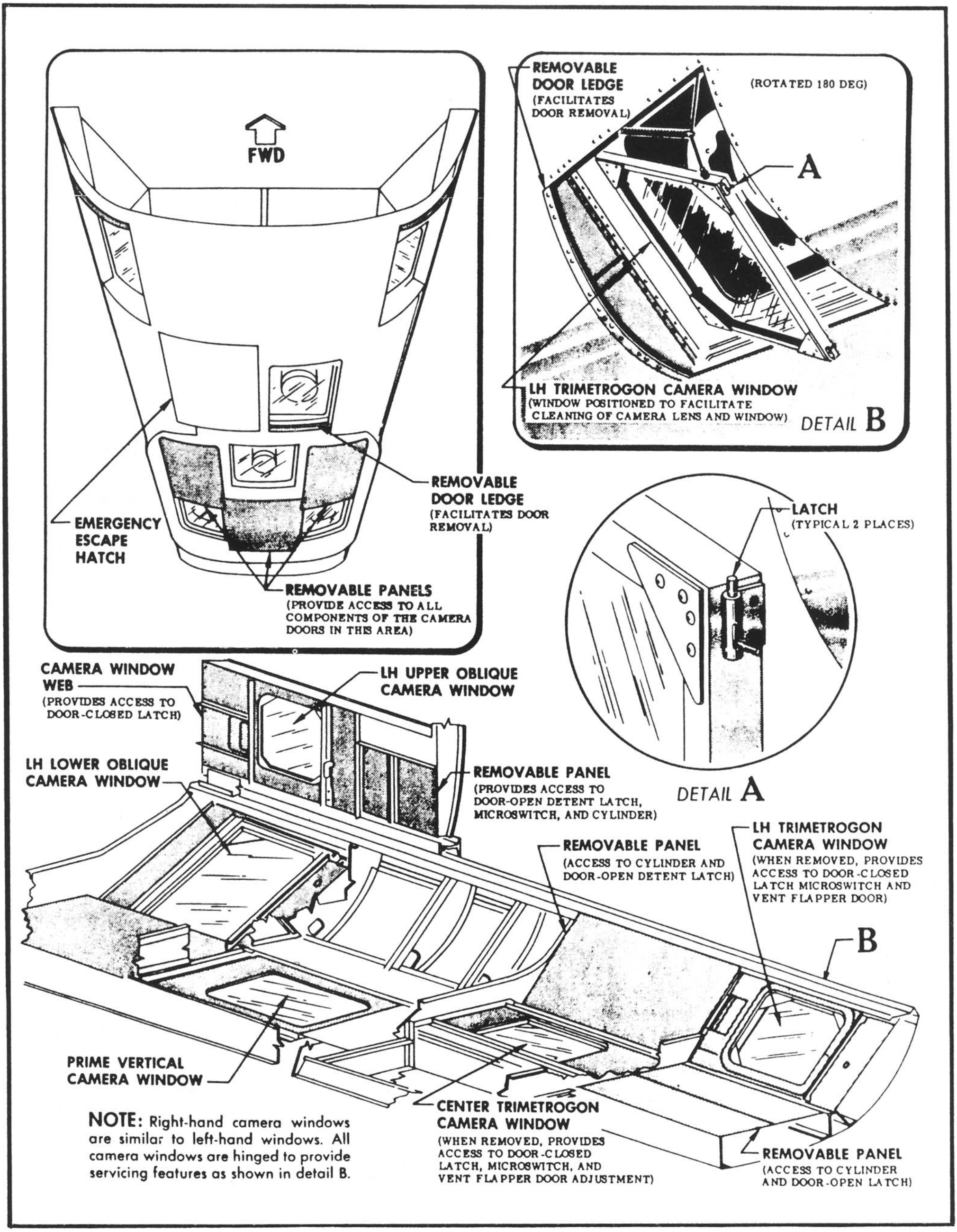
DEPARTMENT OF THE NAVY
UNITED STATES OF AMERICA

TAILHOOK ASSOCIATION
CARRIER NAVY



BOMB BAY CAMERA WINDOWS AND ACCESS DOORS


FWD
EMERGENCY ESCAPE HATCH
REMOVABLE DOOR LEDGE (FACILITATES DOOR REMOVAL)
REMOVABLE PANELS (PROVIDE ACCESS TO ALL COMPONENTS OF THE CAMERA DOORS IN THIS AREA)
REMOVABLE DOOR LEDGE (FACILITATES DOOR REMOVAL)
(ROTATED 180 DEG)
A
LH TRIMETROGON CAMERA WINDOW (WINDOW POSITIONED TO FACILITATE CLEANING OF CAMERA LENS AND WINDOW)
DETAIL B
LATCH (TYPICAL 2 PLACES)
DETAIL A
CAMERA WINDOW WEB (PROVIDES ACCESS TO DOOR-CLOSED LATCH)
LH UPPER OBLIQUE CAMERA WINDOW
LH LOWER OBLIQUE CAMERA WINDOW
REMOVABLE PANEL (PROVIDES ACCESS TO DOOR-OPEN DETENT LATCH, MICROSWITCH, AND CYLINDER)
REMOVABLE PANEL (ACCESS TO CYLINDER AND DOOR-OPEN DETENT LATCH)
LH TRIMETROGON CAMERA WINDOW (WHEN REMOVED, PROVIDES ACCESS TO DOOR-CLOSED LATCH MICROSWITCH AND VENT FLAPPER DOOR)
B
PRIME VERTICAL CAMERA WINDOW
CENTER TRIMETROGON CAMERA WINDOW (WHEN REMOVED, PROVIDES ACCESS TO DOOR-CLOSED LATCH, MICROSWITCH, AND VENT FLAPPER DOOR ADJUSTMENT)
REMOVABLE PANEL (ACCESS TO CYLINDER AND DOOR-OPEN LATCH)

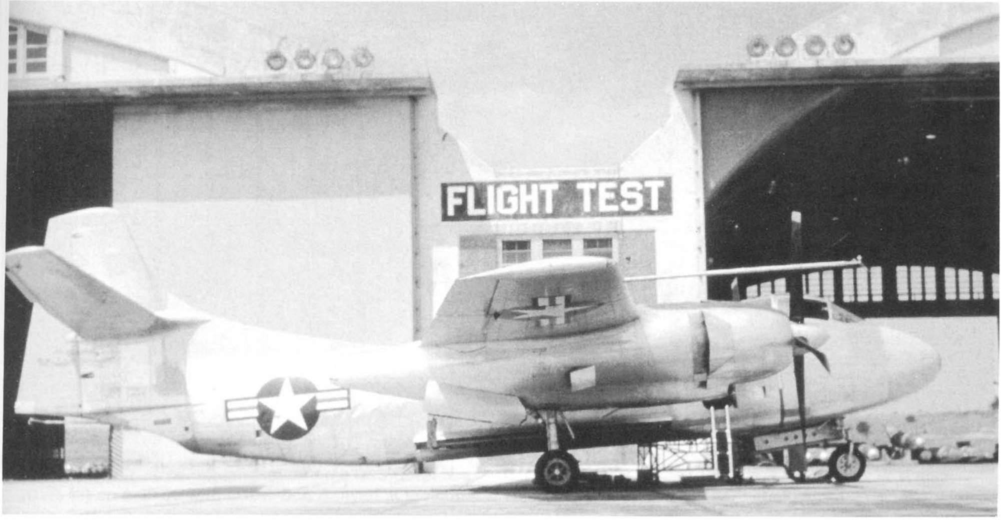
NOTE: Right-hand camera windows are similar to left-hand windows. All camera windows are hinged to provide servicing features as shown in detail B.

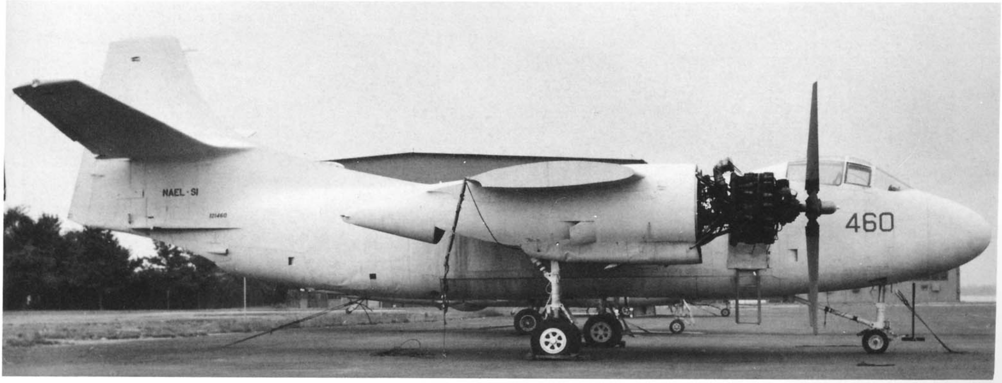
NAVAL AIR TEST CENTER (NATC), PATUXENT RIVER MARYLAND

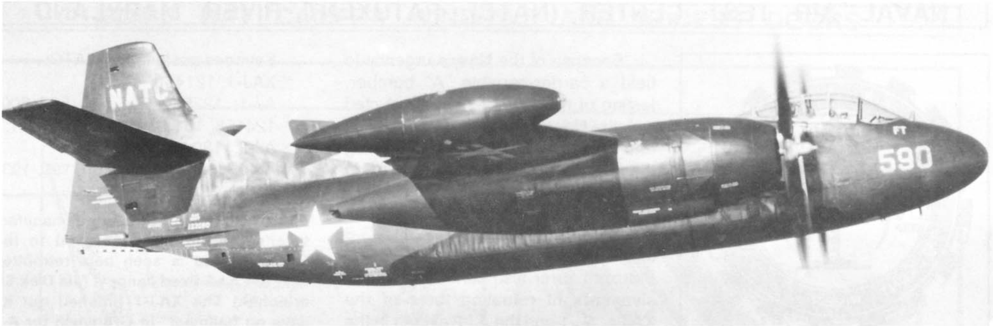
Because of the Navy's urgency to field a carrier-capable "A" bomber, testing of the Savage was conducted with the Naval Air Test Center (NATC) and VC-5 concurrently. Besides testing the XAJ-1, NATC received the first production AJ-1 122590 on 19 September 1949. Delivery of subsequent AJ-1s were staggered between VC-5 and the Naval Air Test Center. NATC Patuxent River also conducted extensive in-flight refueling tests of the XAJ-1, AJ-1 and the AJ-2 aircraft in the tanker role.

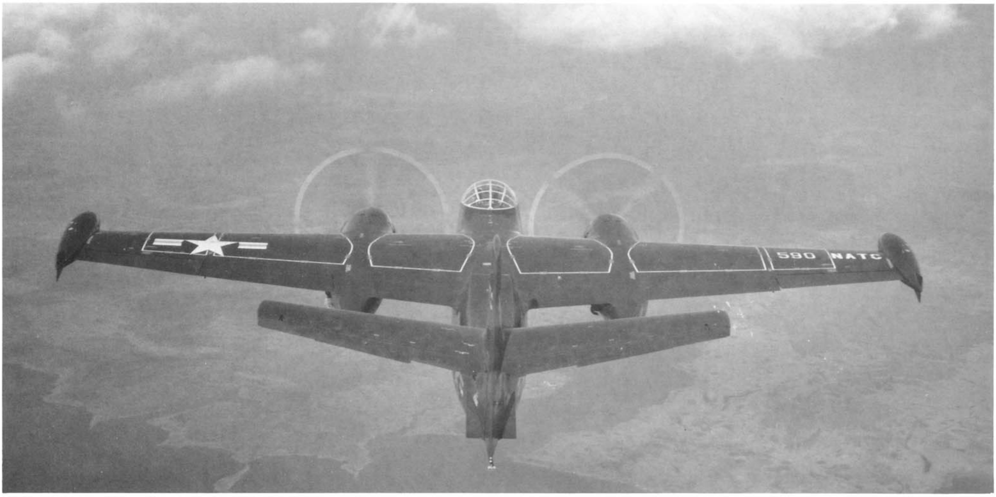
Savages assigned to NATC:
XAJ-1; 121460.
AJ-1; 122590, 594, 596, 597, 600, 124158, 161, 174, 179, 181, 861.
AJ-2; 130407, 408.
AJ-2P; 128045, 129186, 190, 193.

The XAJ-1 after completing manufacturer's testing was assigned to the NATC. 121460 is seen here retrofitted with the AJ-1 fixed canopy. (via Dick Starinchak) The XAJ-1 finished out its days on bailment to Grumman for A-6 nose gear testing. (R. Esposito on11-67)






NATC
FT
590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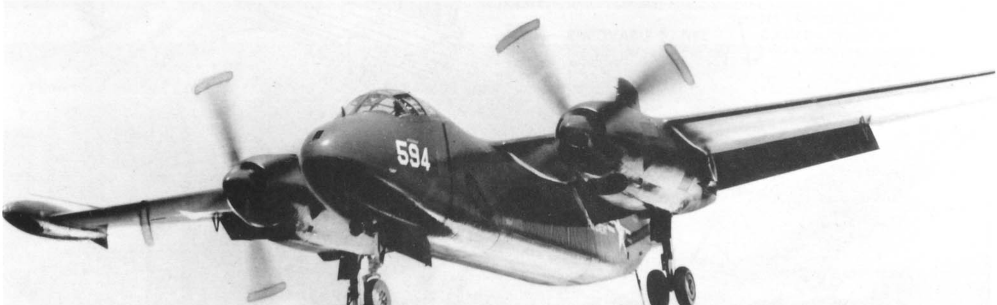
NATC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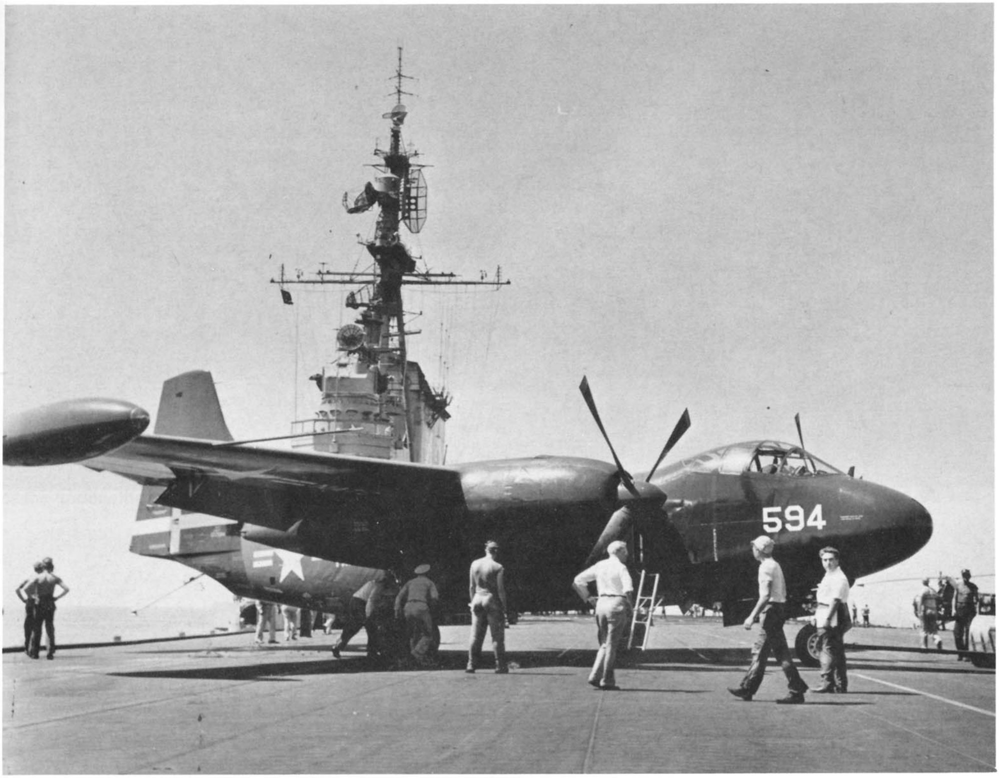
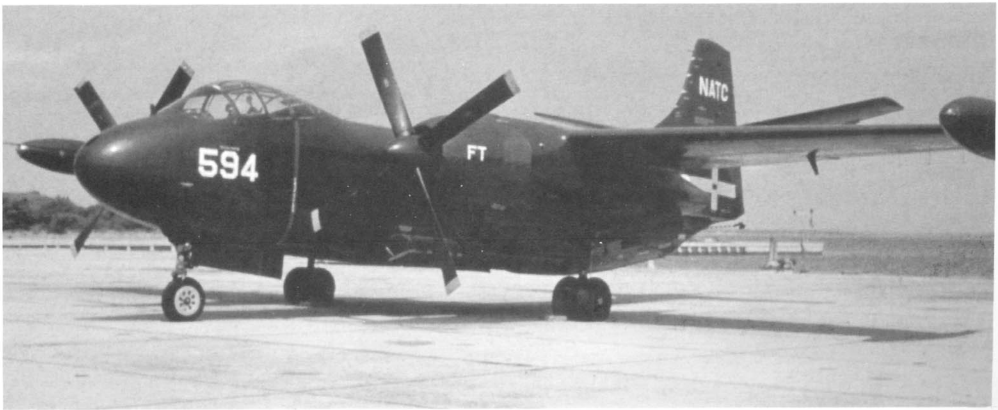
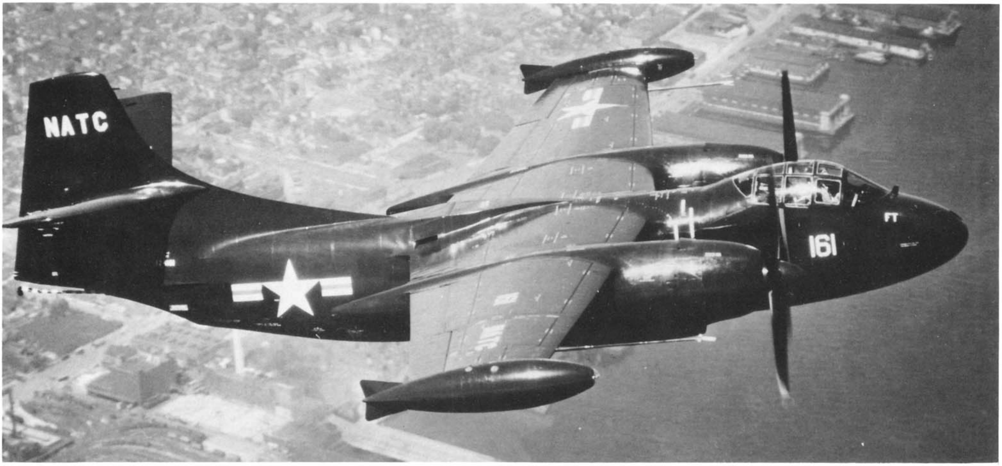
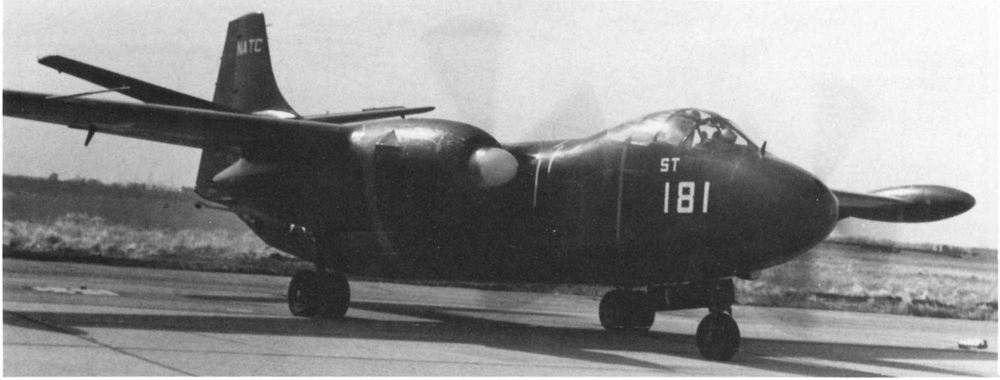


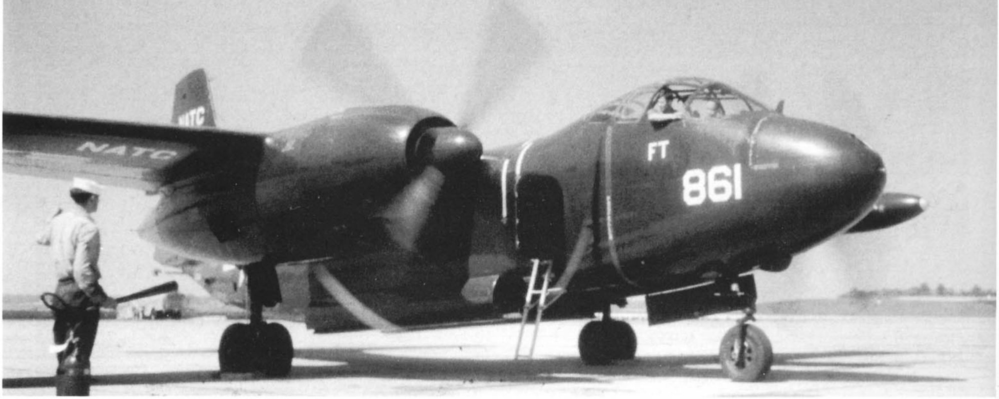
Previous page: two views of the first production AJ-1 122590 on a 12-8-49 test hop. The canopy was still sliding as on the XAJ-1, but white framing has been added to it. The aircraft was flown without prop spinners, an oddity for Savages. Bottom, 122594 or fifth production AJ-1 makes its first carrier landing aboard the USS Coral Sea (CVB-43) on 8-30-50 with LCDR Don Runyan at the controls. (National Archives)

Above, AJ-1 122594 during deck handling tests conducted during the Savage's first carrier trials on 8-30-50. The lower tail has white camera registration stripes painted on it. (National Archives) Below, AJ-1 122594 at a later date with "FT" for Flight Test added to the engine nacelles. Nose gear was painted in a non-standard silver. (via Dick Starinchak)




NATC
FT
161


NATC
ST
181


NATC
NATC
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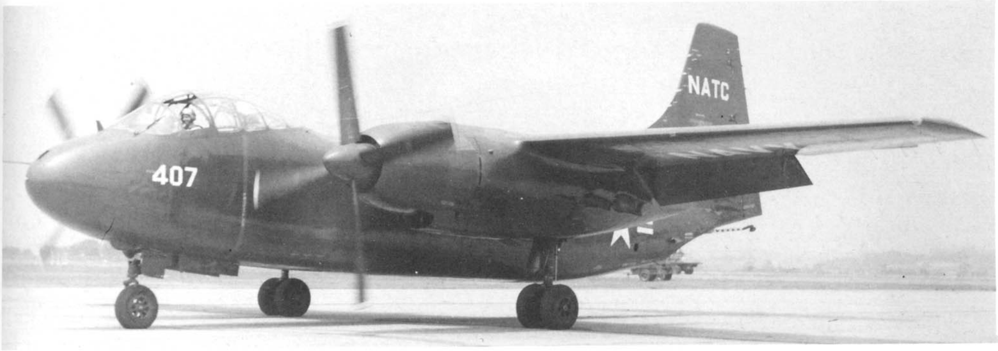
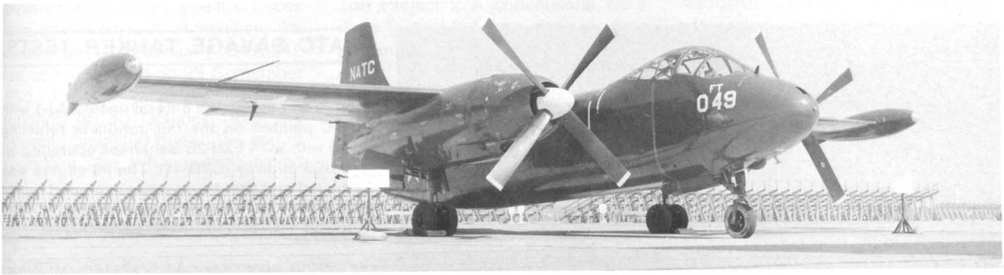
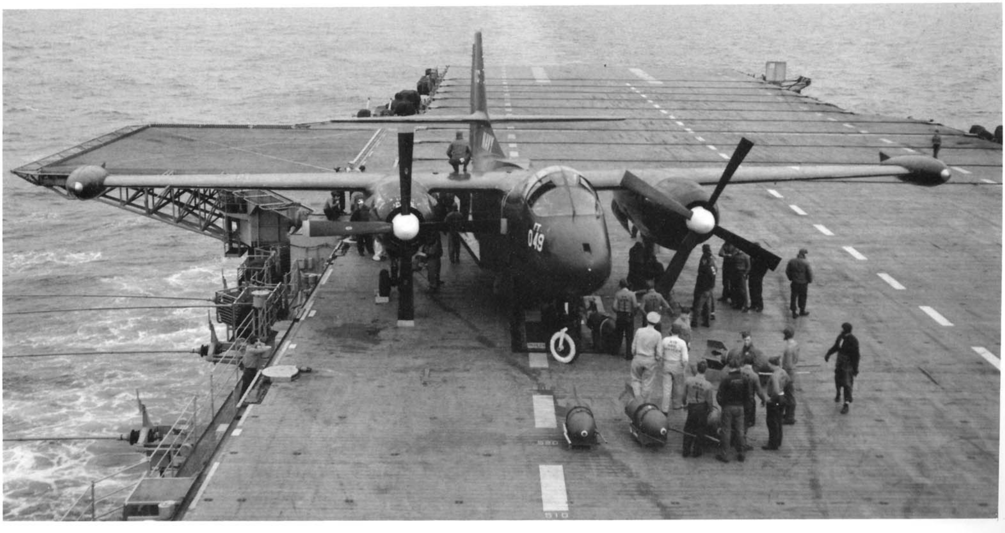
861

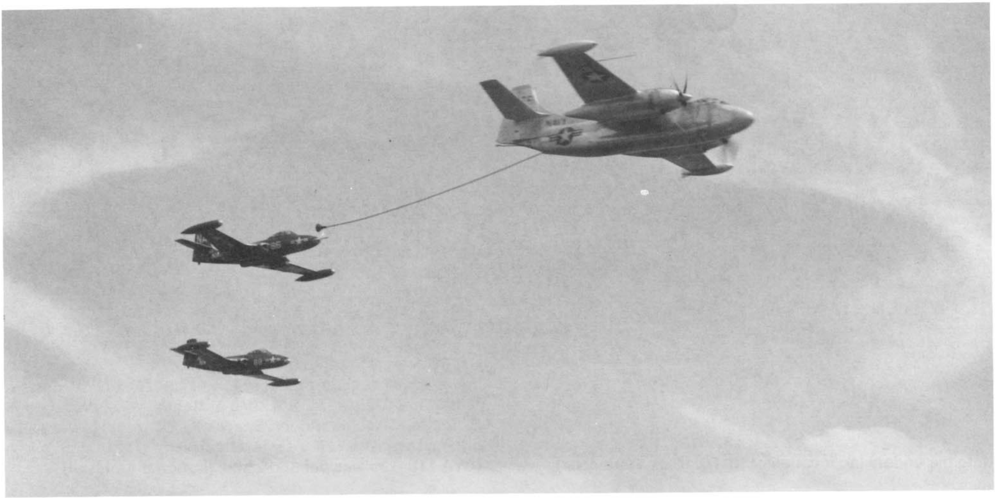


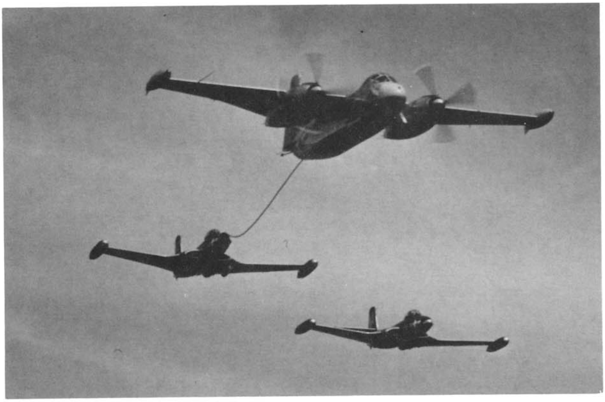
Previous page, AJ-1 124161 in flight over Philadelphia in August 1950. (National Archives) AJ-1 124181 assigned to System Test (ST), turns-up for a test hop. The prop spinners were white. (AAHS) Flight Test (FT) AJ-1 124861 turning up. Note the underwing location of NATC. (Dick Starinchak)

This page; top, third production AJ-2 130407 taxiis out. (via Fred Roos) Middle, AJ-2 134049 at Bolling AFB, Washington D. C., on 5-15-54. (Roger Besecker) Bottom, AJ-2 134049 during bomb handling tests aboard the USS Ticonderoga (CVA-11). Tire was painted white. (National Archives)





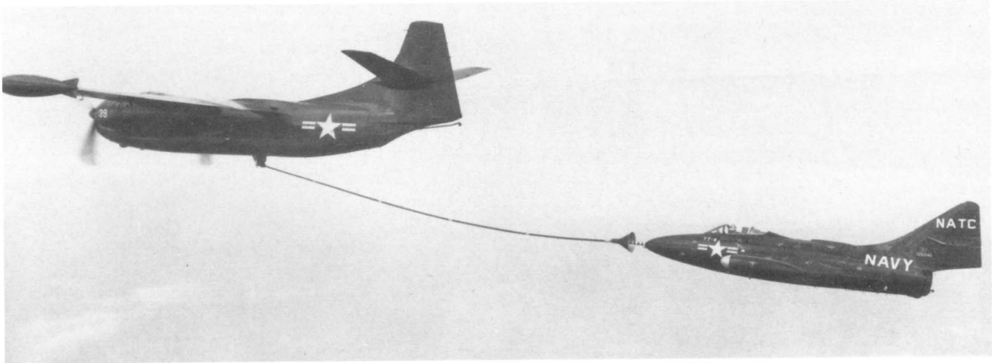




NATC SAVAGE TANKER TESTS

Above and at left, the natural metal XAJ-1 with NATC painted on the tail conducts refueling tests with VC-4 F2H-2B Banshees operating off the USS Midway (CVB-41). The jet engine was removed and the drogue was extended out of the former jet exhaust opening. Below, AJ-1 refuels an NATC F9F. (National Archives)

Following page; top, AJ-1 124158 retrofitted with the AJ-2 tail group refuels NATC F11F-1 141729 in September 1957. (National Archives) Bottom, a VC-5 AJ-1 lands on the USS Yorktown (CVA-10) after being retrofitted as a 27 Alpha carrier on 4-16-53. The Savage's wingspan is nearly the width of the carrier deck. (National Archives)



SAVAGE CAPABLE ESSEX AND ORISKANY CLASS AIRCRAFT CARRIERS

Because of the weight and size of the Savage, the only carriers capable of operating the AJs were the three Midway class carriers. The first Essex class carrier capable of handling the Savage, the USS Oriskany (CVA-34), was commissioned on 25 September 1950. The Oriskany was originally launched on 13 October 1945, but was not completed due to the end of World War Two. When commissioned in 1950, she was completed as the first Project 27A carrier.

The Project 27A conversions were done to enable Essex class ships to become jet capable. The conversion added a reinforced flight deck, increased fuel capacity, and provided more deck space through the removal of the twin 5-inch gun mounts and through the use of streamlined island structures. A total of nine carriers were thus converted and an additional six were modernized to Project 27C standards. The 27 Charlie ships incorporated all the improvements of the 27 Alphas, plus more powerful arresting gear, steam catapults, decking over the number three elevator, angled deck, and installation of a deck edge elevator and a "hurricane" bow.

USS ORISKANY	(CVA-34)	09-25-50	27A
USS ESSEX	(CVA-9)	01-15-51	27A
USS WASP	(CVA-18)	09-10-51	27A
USS KEARSARGE	(CVA-33)	02-15-52	27A
USS LAKE CHAMPLAIN	(CVA-39)	09-19-52	27A
USS BENNINGTON	(CVA-20)	11-30-52	27A
USS YORKTOWN	(CAV-10)	01-02-53	27A
USS RANDOLPH	(CVA-15)	07-01-53	27A
USS HORNET	(CVA-12)	10-01-53	27A
USS BON HOMME RICHARD	(CVA-31)	1955	27C
USS SHANGRI-LA	(CVA-38)	1955	27C
USS HANCOCK	(CVA-19)	03-01-54	27C
USS INTREPID	(CVA-11)	06-18-54	27C
USS LEXINGTON	(CVA-16)	09-01-55	27C
USS TICONDEROGA	(CVA-14)	12-11-54	27C

LOADING "NUKES" ON 27A AND 27C CARRIERS

BY CAPT BOB DREESEN

When the wartime Essex/Oriskany class carriers were modernized, they were equipped with nuclear weapons storage areas fore and aft and dedicated weapons elevators for the nukes. The 27 Alpha carriers had only a single nuclear weapons elevator, slightly forward and to the left of the island, whereas the 27 Charlie carriers had two of them. The weapons were handled by a special overhead cradle (about six feet by twelve feet) on rails that went through the hangar deck. The cradle resembled an upside down desk, with the bomb held in place by the legs. When the cradle reached the elevator the bomb was put on the platform on the elevator which raised it into the AJ's bomb bay. The Savage would be parked very precisely over the weapons elevator, with the landing gear positioned on special markings painted on the flight deck. The platform was adjustable and could be moved left and right and up and down or twisted to fit the weapon exactly into the shackles.

Since the one nuclear weapons elevator on the 27 Charlie's represented a single point of failure, it was prudent to develop an alternative way to load weapons if the elevator was damaged in combat. That alternative was to use the deck-edge aircraft elevator. It required the Savage to be positioned very carefully with its main landing gear right at the edge of the elevator well so that the bomb bay was over the edge. The entire bomb cradle was taken off the rails and put on the elevator and the elevator then raised the bomb into the waiting bomb bay. If used, this backup loading procedure would have been very difficult and dangerous.

VC-6 AJ-1s carrier qualify aboard the Midway on 5-14-51. The larger deck area of this class is evident. (NASM)

HEAVY ATTACK TRAINING UNIT, (HATU)

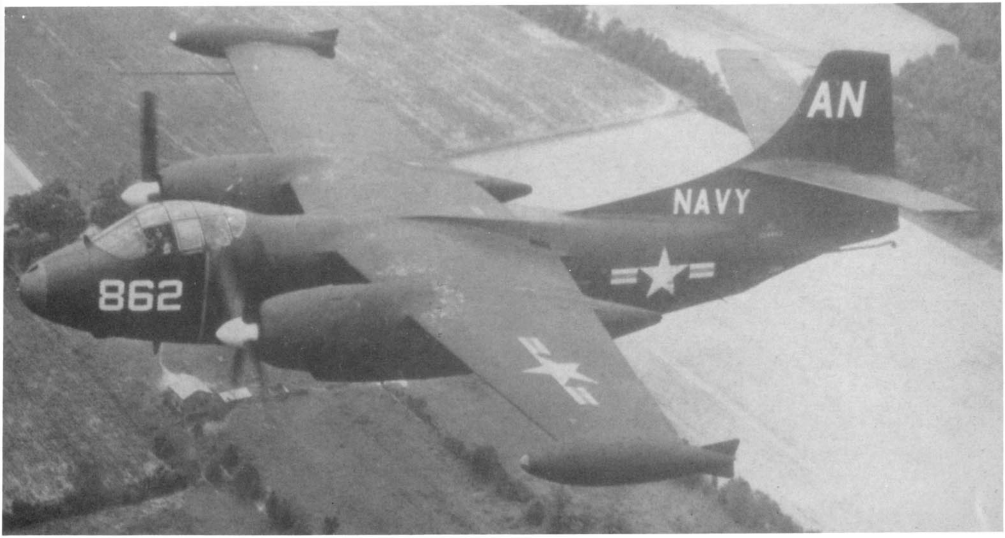
The Heavy Attack Training Unit (HATU) was established in February 1953 at NAS Norfolk, Virgina. The curriculum of HATU was composed of six basic courses of instruction:

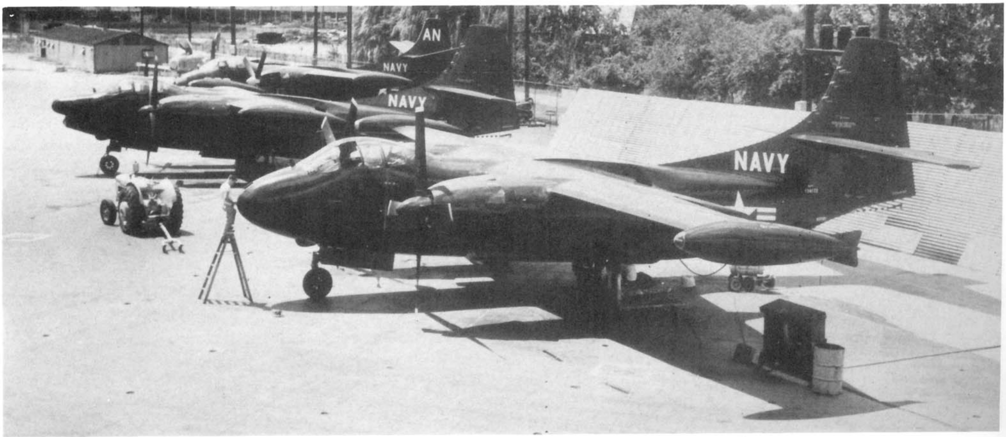
1.) Plane commander course.
2.) Bombardier/Navigator course.
3.) Third crewman course.
4.) Delivery instruction course.
5.) ASB bombing system course.
6.) Heavy attack indoc course.

At HATU you were taught the electronic circuitry of each weapon, how it was armed, loaded, monitored in flight, and its damage criteria depending on burst height.

The HATU unit was disestablished in late 1956 and reestablished in 1957 as HATULANT (Heavy Attack Training Unit Atlantic) and HATUPAC (Heavy Attack Training Unit Pacific). The following Savages were assigned to HATU: AJ-1s 122596, 124168, 856, 857, 862; AJ-2s 130419, 134036, and 050.

Second-to-last production AJ-1 124862 belonging to HATU in fight with the pilot's escape window open and with a red nose cone and white prop spinners. (via Bob Lawson) Bottom, a HATU AJ-1 parked behind a new AJ-2 and AJ-2P at North American's Columbus, Ohio, plant. (via Bob Lawson)





PHOTOGRAPHIC SQUADRON SIXTY-ONE, (VJ-61)

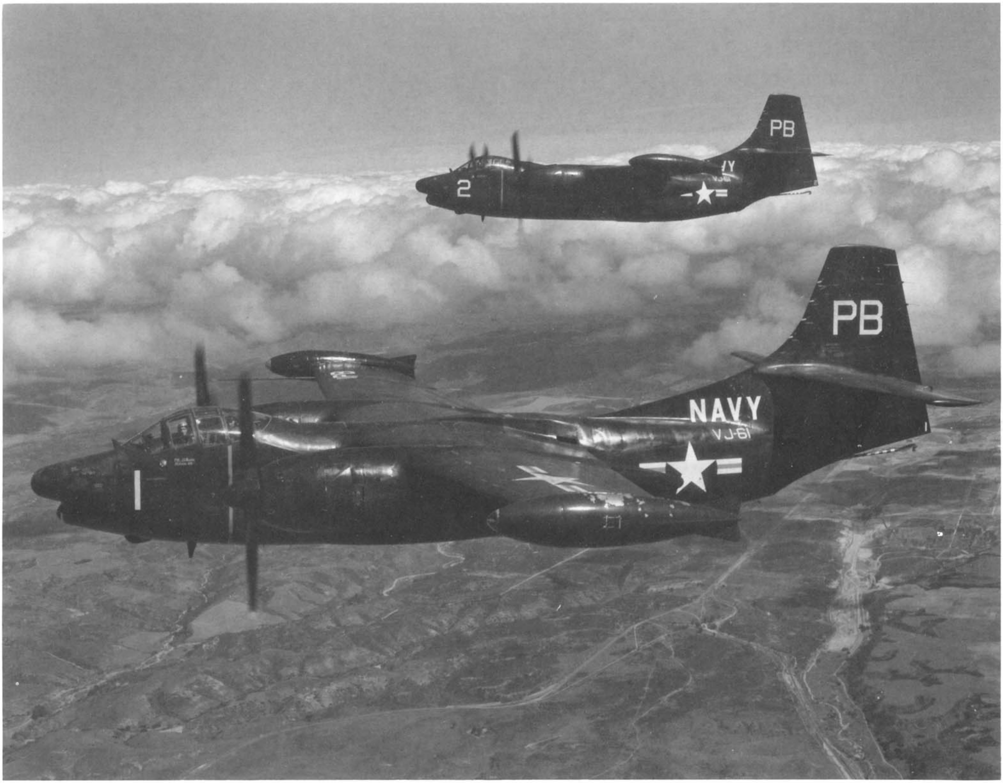
Photographic Squadron Sixty-One (VJ-61) was originally established as Patrol Squadron Sixty One (VP-61) on 20 January 1951. The squadron was stationed at NAS Miramar, California, on 5 March 1952 when VP-61 was redesignated VJ-61. VJ-61 was transferred to NAS Agana, Guam in June 1956 and was redesignated Heavy Photographic Squadron Sixty One (VAP-61) on 2 July 1956.

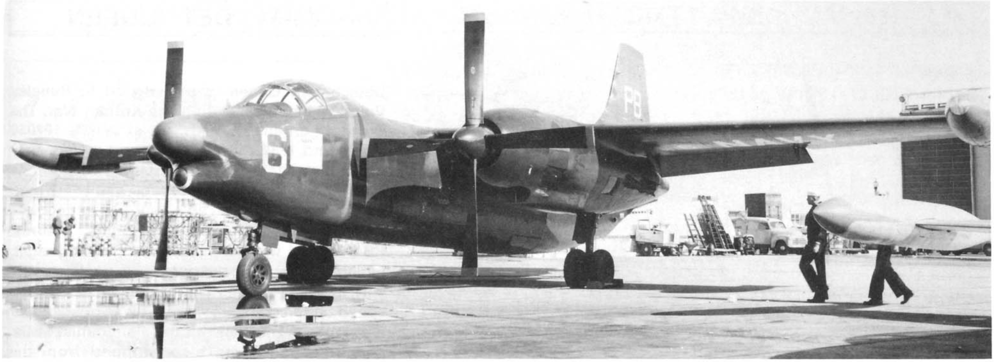
Besides conducting routine and secret Navy operations, VJ-61 used its AJ-2Ps to aid the Department of the Interior in mapping the Western States.

The squadron, while designated VJ-61, operated fourteen AJ-2Ps numbered as follows: 128047, 048, 050, 053, 054, 129185, 187, 188, 192, 193, 130422, 423, 425, 134075. The squadron also operated AJ-2 134041 for a short period of time.

Below, VJ-61 AJ-2Ps 128050 (PB/1) and 128054 (PB/2) in flight over Hawaii in March 1953. 128050 had the squadron insignia and the wording CDR J. S. Harris and J. C. Caron ADC painted on the nose. The location of the upper wing codes can be seen on 128050 and both aircraft have the nose numbers repeated on the rudders. (National Archives)

At Right, Top, VJ-61 AJ-2P 129185 at NAS Oakland on 10-18-53. Radome was flat black. Two piece nose gear door was used on the AJ-2P and the AJ-2. (via Smally) Middle, VJ-61 AJ-2P over Diamond Head on the island of Oahu on 3-24-54. Black anti-glare panels can be seen on the top of the engine nacelles. (USN/Tailhook) Bottom, VJ-61 AJ-2P 129188 with camera nose open in 1955. Prop domes were red. (Swisher)

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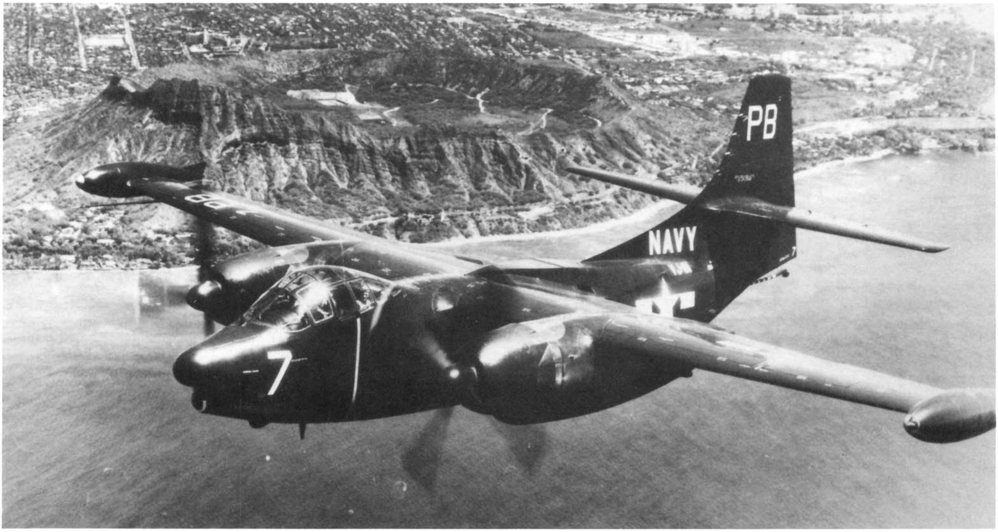
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NAVY
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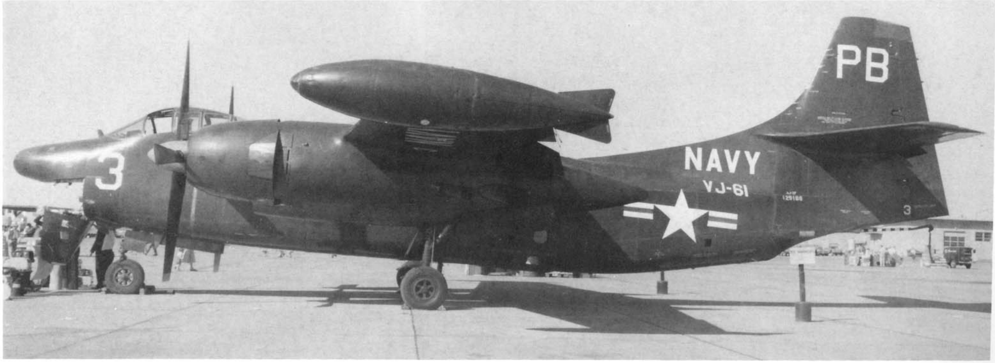
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VJ-61
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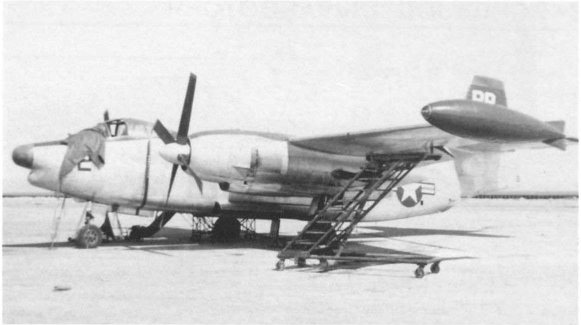
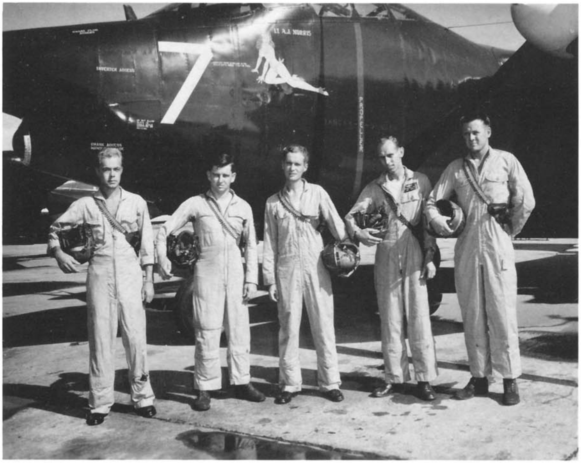
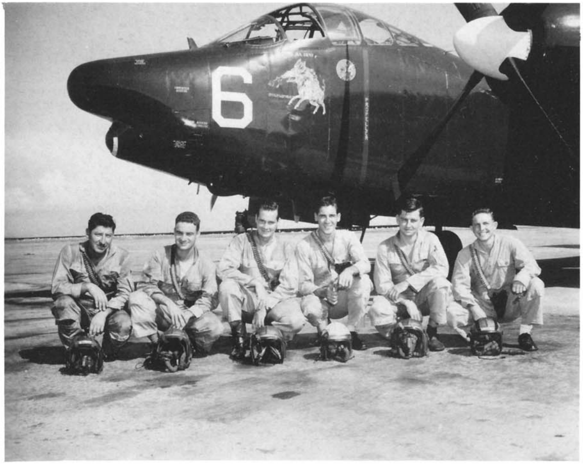
3



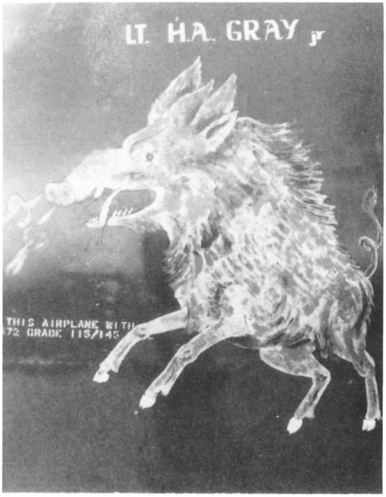




VJ-61 DET QUEEN

Detachment Queen was assigned to Sangley Point, Philippines, during the Korean War. The Det was originally made up of AJ-2P 128050 (PB/1) and 128054 (PB/2) as seen on page sixty three. Det Queen enhanced the two aircrafts markings by adding a red fin tip and white prop spinners. One of the Det's secret missions was to fly surveillance over China and North Korea. PB/2 128054 was stripped of all excess weight, including the tail hook (as seen on the upper left) in an effort to increase the aircrafts top speed on the deck. In theory it was possible for a stripped AJ to out-run the Communist MIGs. The blue paint was also stripped from the undersides and sides of PB/2 and replaced by waxed natural metal surfaces to increase the AJs speed further. During these missions all crewmen carried 45 caliber hand guns with bandoleers of ammunition and brought aboard Thompson sub-machine guns.

PB/1&2 were replaced in June 1954 by AJ-2P 129185 (PB/6) and 130423 (PB/7). PB/7 was assigned to the OIC (Officer In Charge), LT A. J. Norris, who added the bikini-clad nose art to his aircraft as seen at left. Bottom left shows the "Mean Hairy Hog", PB/6 with six of detachment Queen's crew posing in front of it. From left to right: Espenozia (ADC), Duke (ENS), H. A. Gray JR. (LT), B. Street (flight engineer), C. Easton (LTJG), and N. D. Meyer (PHAN). The squadron insignia was also carried to the right of the "Mean Hairy Hog" and on the opposite side of the aircraft. (all photos Vince Fleming)



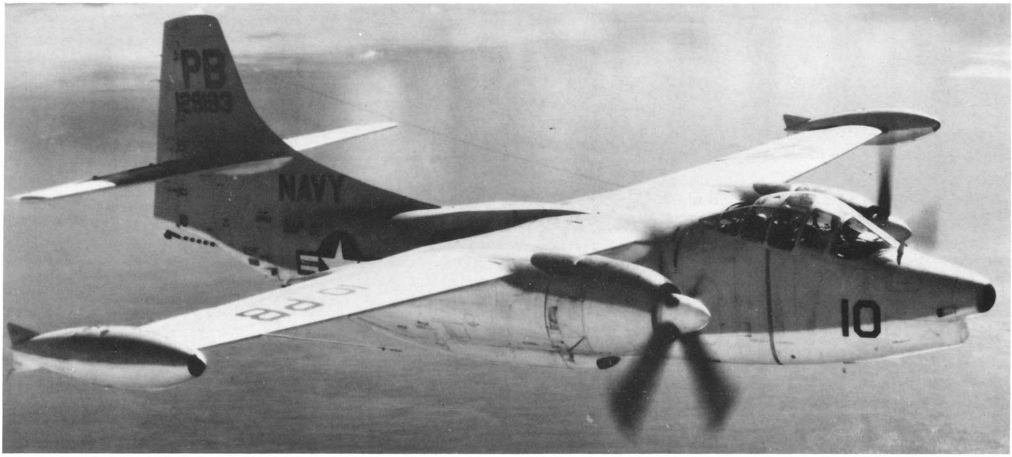
HEAVY PHOTOGRAPHIC SQUADRON SIXTY-ONE, (VAP-61)

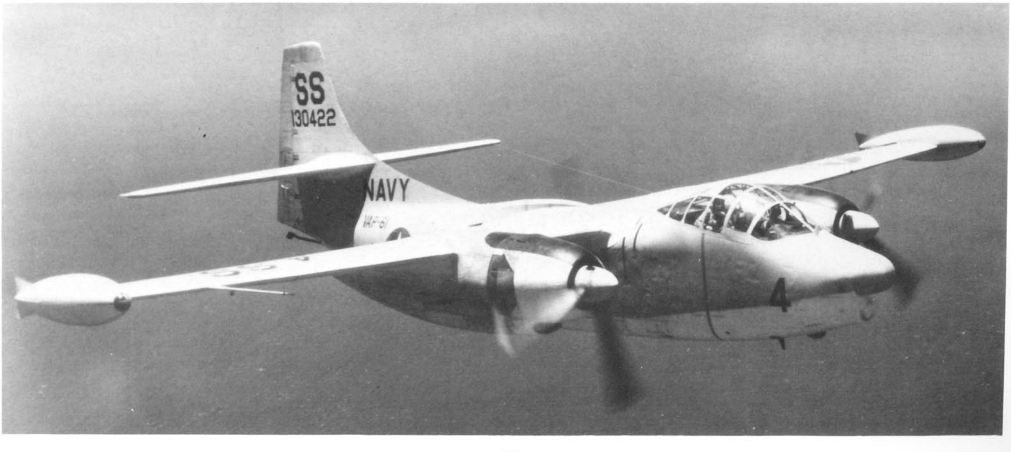
VAP-61 was established when VJ-61 was redesignated VAP-61 on 2 July 1956 at Agana, Guam. On 1 July 1959 VAP-61 was redesignated Composite Photographic Squadron Sixty-One (VCP-61). VCP-61 reverted back to VAP-61 on 1 July 1961 and was decommissioned on 1 July 1971.

VAP-61's mission was to provide long range photographic intelligence for the Pacific Fleet. The squadron flew the AJ-2P Savage into early 1959 when the Douglas A3D-2P (RA-3B in 1962) Skywarrior took over.

The following AJ-2Ps were operated by VAP-61: 128047, 048, 051, 054, 129185, 187, 193, 194, 195, 130422,423, 425, 134073, and 075. AJ-2 130408 was also used by the squadron.

VAP-61 AJ-2P 129193 in 1956 near Guam. The aircraft still carried the VJ-61 "PB" tailcode. The AJ-2 style canopy was installed on this AJ-2P. This AJ-2P was damaged and written off at Oppama, Japan, in May 1959. Bottom, AJ-2P 130422 near Guam with new "SS" tailcode. (USN/Tailhook)

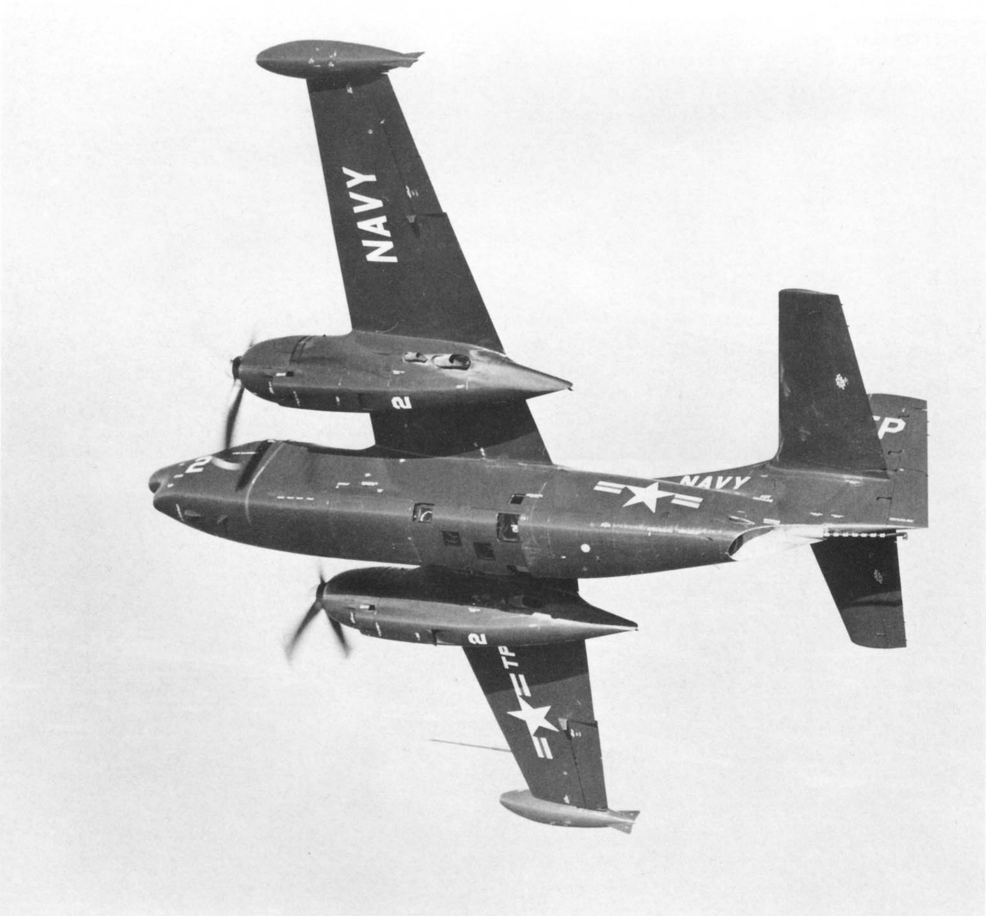




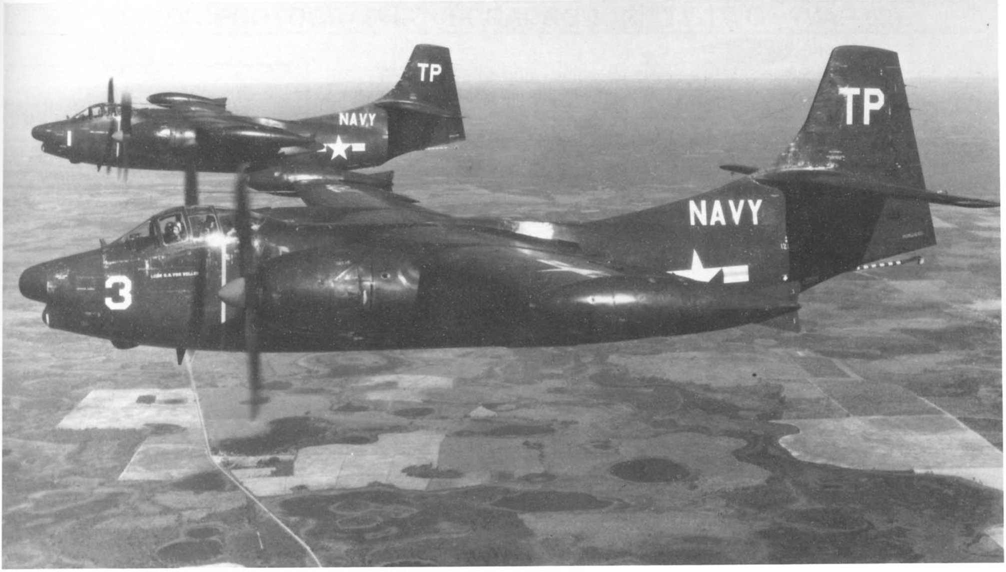
PHOTOGRAPHIC SQUADRON SIXTY-TWO, (VJ-62)

Photographic Squadron Sixty-Two (VJ-62) was commissioned on 10 April 1952 at NAS Jacksonville, Florida. In October 1952 the squadron moved to NAS Sanford, Florida. Then in July 1955 the squadron was transferred to NAS Norfolk, Virgina, where the squadron was redesignated Heavy Photographic Squadron Sixty-Two (VAP-62) on 2 July 1956.

When commissioned, VJ-62 was assigned Grumman F7F-2P Tigercats and Consolidated PB4Y Privateers to fulfill its assigned mission. By the time the squadron moved to NAS Sanford the F7Fs and PB4Ys were already being replaced by the AJ-2P. The squadron operated from seven to ten AJ-2Ps as its primary photo platform. In addition, one or two SNB-5P aircraft were assigned for instrument training and limited aerial photo work.

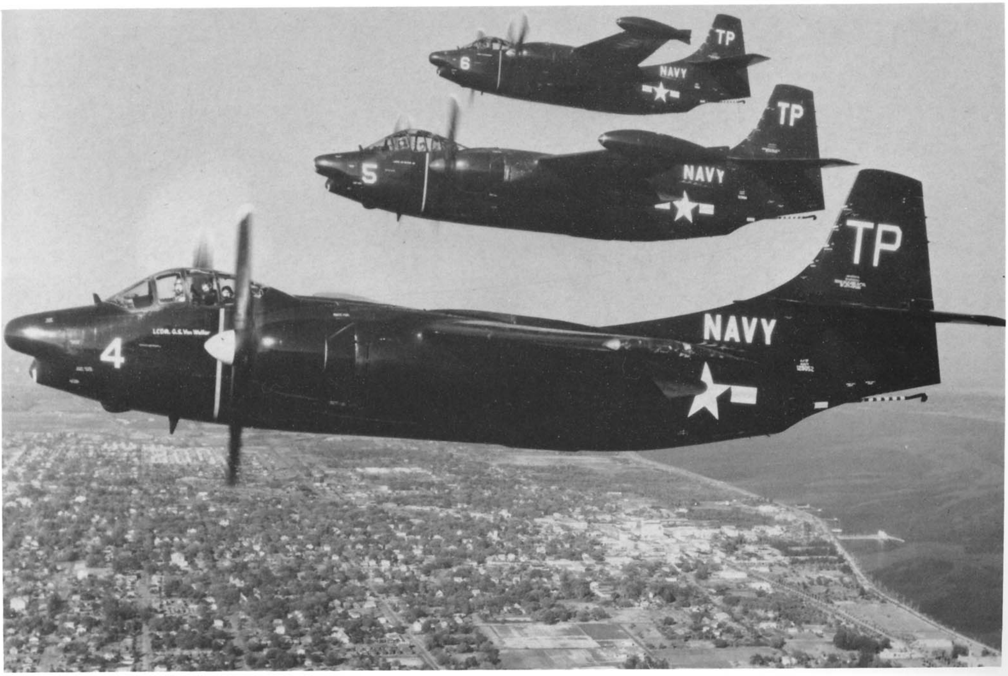


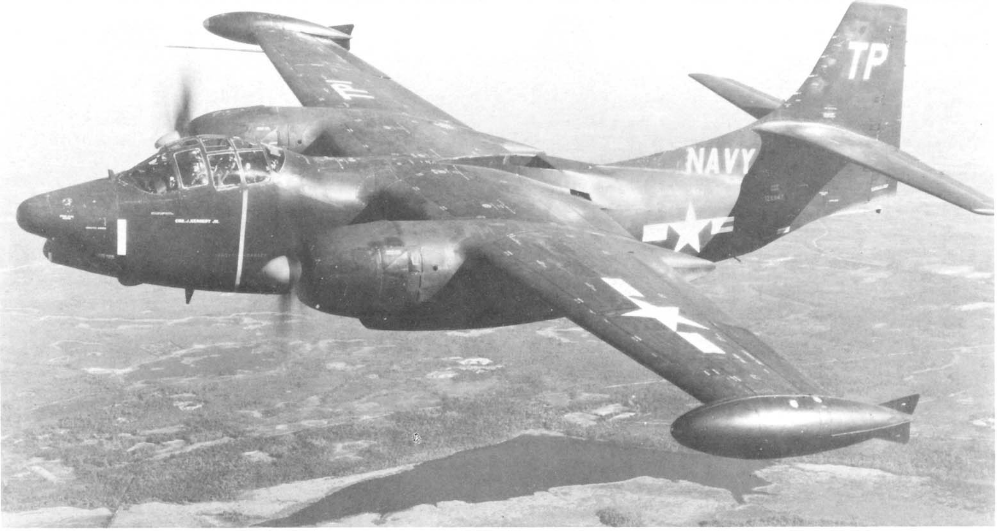
VJ-62 AJ-2P 128046 seen from below with all the camera ports open. The nose number 2 is repeated under the engine nacelles. (NAA)



VJ-62 AJ-2Ps 1/TP and 3/TP in flight. (National Archives)

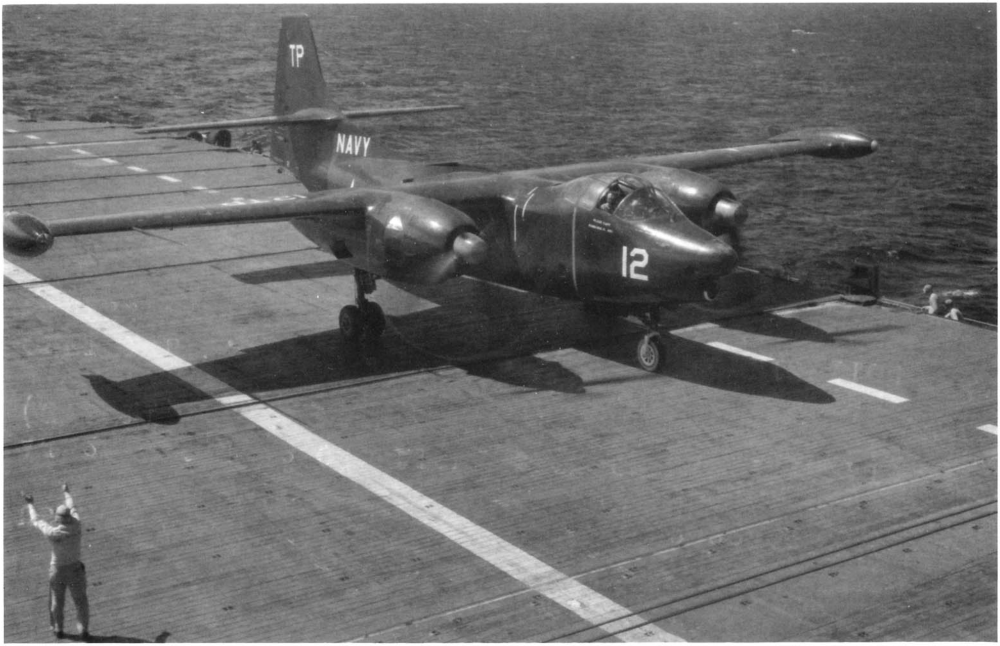
VJ-62 AJ-2Ps 4/TP (128052), 5/TP, and 6/TP in flight. 128052 4/TP in the foreground does not have tip tanks installed. (National Archives)





VJ-62 AJ-2P 128047 with CDR J. Kennedy Jr. painted on the nose. The jet engine intake door is open and the prop spinners are painted red. (NAA)

VJ-62 AJ-2P taxis forward after trapping aboard the USS Intrepid (CVA-11) on 2-22-55. The right side of the nose wheel and strut is white. (National Archives)

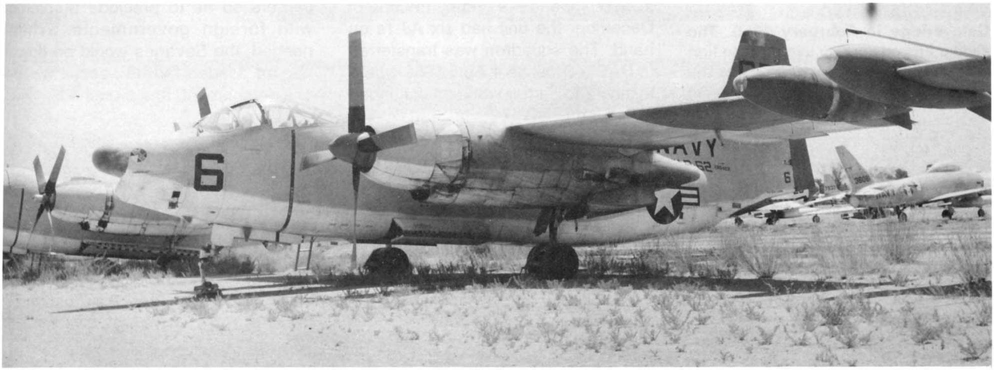


HEAVY PHOTOGRAPHIC SQUADRON SIXTY-TWO, (VAP-62)

VAP-62 came into being when VJ-62 was redesignated VAP-62 on 2 July 1956. The squadron was transferred from NAS Norfolk, Virgina, to NAS Jacksonville, Florida, in August 1957, where it shared the Atlantic Fleet Photographic Laboratory with VFP-62. The squadron tested an A3D-1P Skywarrior from 14 October until 31 December 1957 and eventually replaced its Savages with A3D-2P Skywarriors in October 1959.

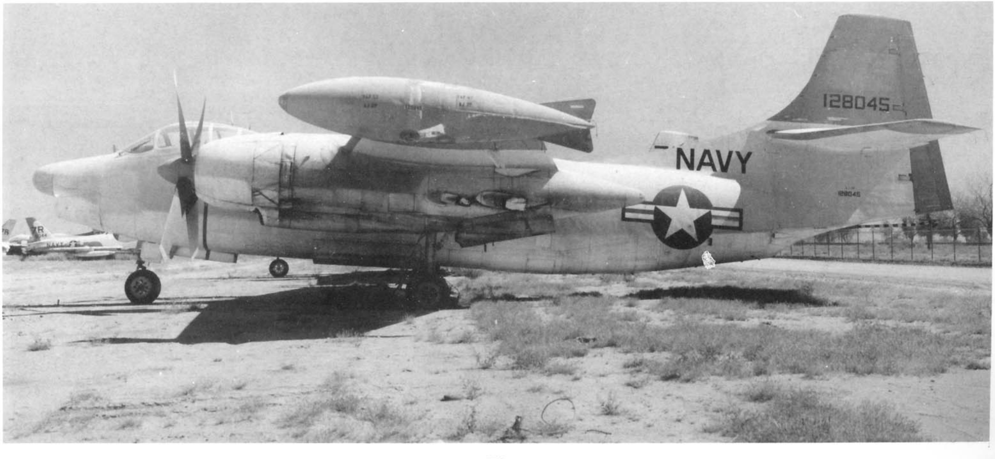
In carrying out its mission, the squadron conducted aerial photographic reconnaissance, and operated photographic and photo interpretation facilities. In addition, VAP-62 routinely provided cartographic services for such departments as the Army Map Service, Coast and Geodetic Survey, Army Corps of Engineers, Navy Hydrographic Office, and the US Department of Agriculture.

VAP-62 never deployed in its entirety. Rather it would send one, two, or three plane detachments.



VAP-62 AJ-2P 130422 6/GB in October 1960 with red upper fin and rudder and outer wing panels and tip tanks. Prop spinners were also red. (Harry Gann)

VAP-62 AJ-2P 128045 at NAF Litchfield Park, Arizona, on 3-21-60 in the same scheme as above, but with all squadron markings and code numbers removed. (Swisher)

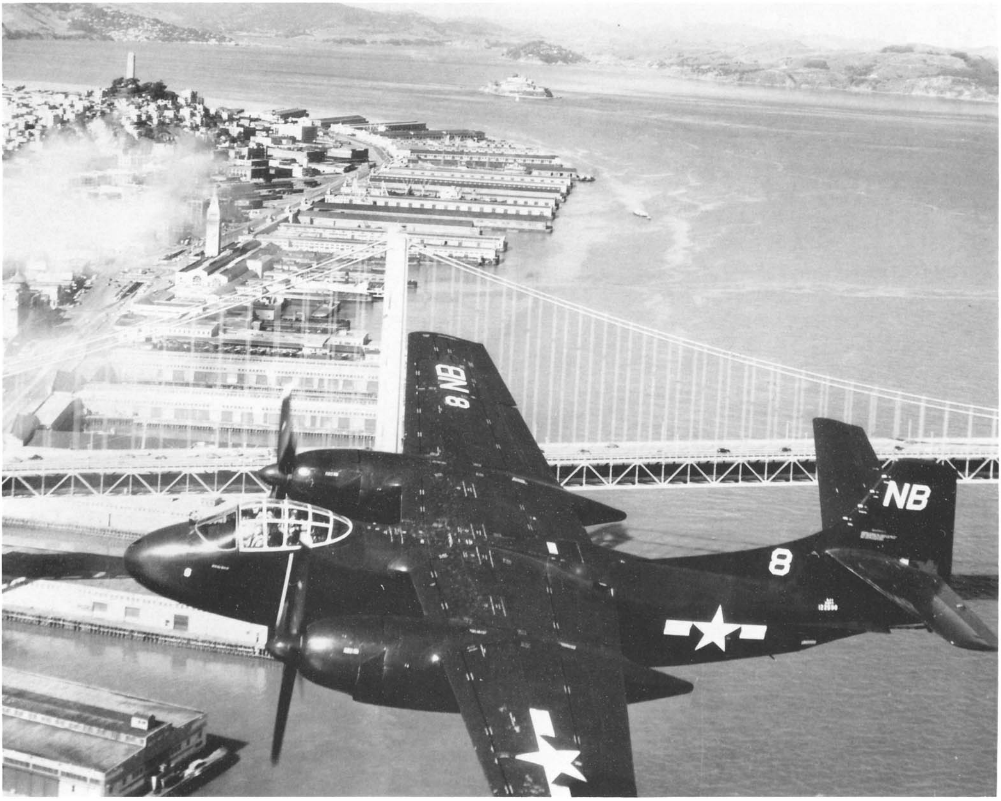


COMPOSITE SQUADRON FIVE, (VC-5)

Commanded by CAPT John T. Hayward, VC-5 was commissioned at NAS Moffett Field, California, on 9 September 1948, with the mission of bringing nuclear weapon capability to the aircraft carrier. The squadron was slated to equip the large CVBs with AJ-1 Savages, but VC-5 developed the Lockhead Neptune into an interim carrier-based nuclear bomber. Twelve specially equipped P2V-3C Neptunes with high altitude engines were delivered for the purpose.

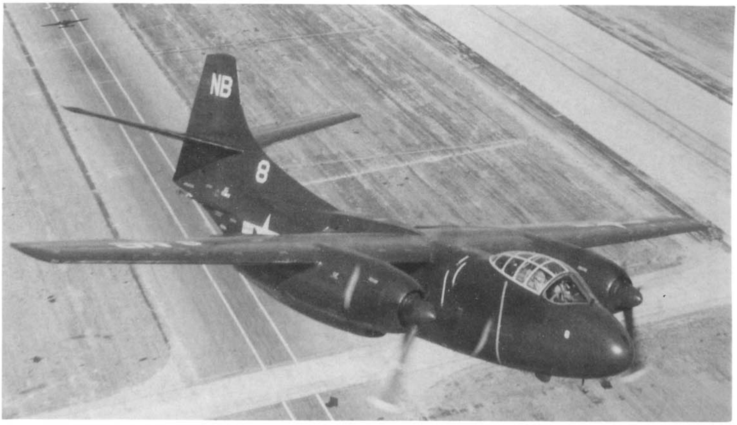
The squadron's first AJ-1 arrived in September 1949 and by the end of December the unit had six AJ-1s on hand. The squadron was transferred to NAS Norfolk on 1 April 1950 where testing and carrier workups continued throughout 1950. On 21 April 1950 VC-5 made the first carrier takeoff of an AJ-1 when CAPT Hayward launched in AJ-1 122600 from the USS Coral Sea (CVB-43). The second AJ-1,122601 flown by CDR Eddie Outlaw followed CAPT Hayward. This was followed by the squadron carrier qualifying on 31 August.

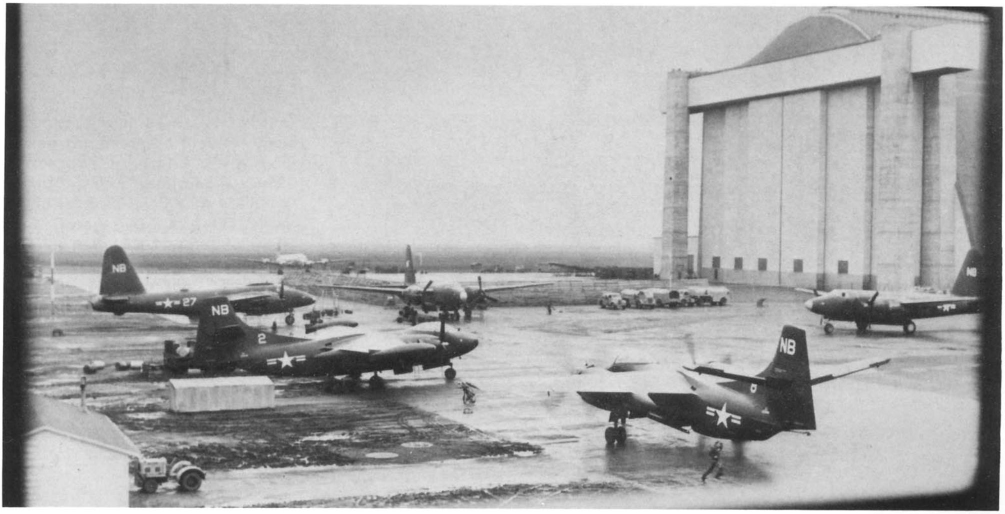
Then from February through September 1951 six AJ-1s and three P2V-3Cs were stationed at NAF Port Lyautey, French Morroco. Nuclear weapons were predeployed aboard carriers so as to preclude problems with foreign governments. When needed, the Savages would be flown aboard, loaded by the special weapons detachment, and launched.

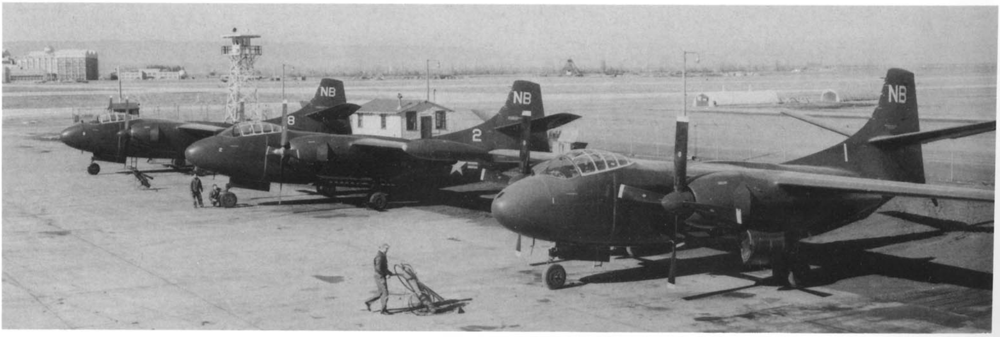


VC-5 AJ-1 122600 flies over the Golden Gate bridge in February 1950. The sliding framed canopy used on the first production AJ-1s was white. Note the extensive wing stenciling. (via S. Pace)

At Right, VC-5 AJ-1 122600 overflies NAS Moffitt's runways in February 1950. The aircraft's number, eight, is repeated on the wing, tail fin spine and on the nose. This aircraft was not equipped with tip tanks and was the aircraft used by CAPT Hayward for the first AJ-1 carrier launch. (National Archives) Below, VC-5 flightline at Moffitt Field with P2V-3Cs and AJ-1s in 1950. (USN via Bob Lawson) Bottom, three VC-5 AJ-1s at Moffitt in February 1950. 1/NB and 8/NB are not fitted with tip tanks and 2/NB is not fitted with prop spinners. (USN/ Tailhook)







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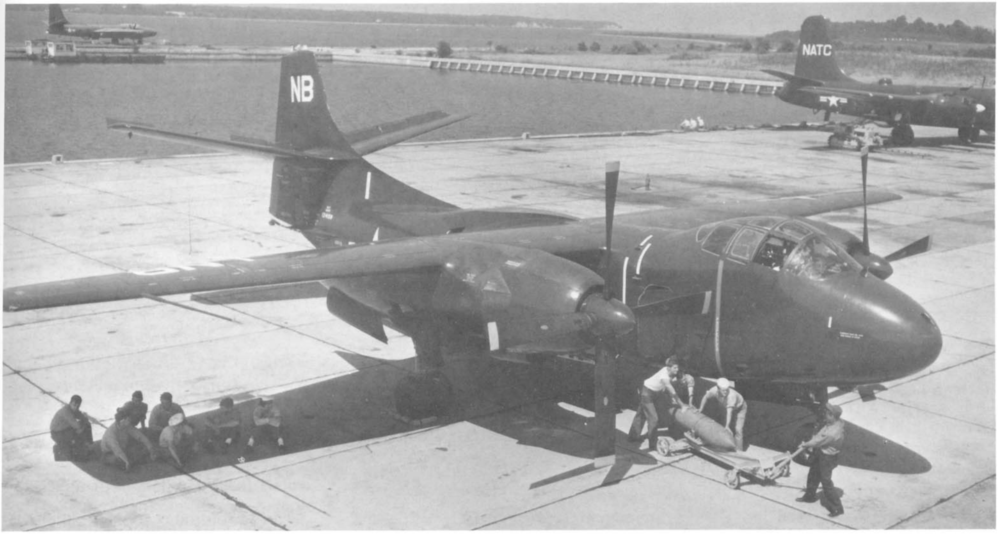
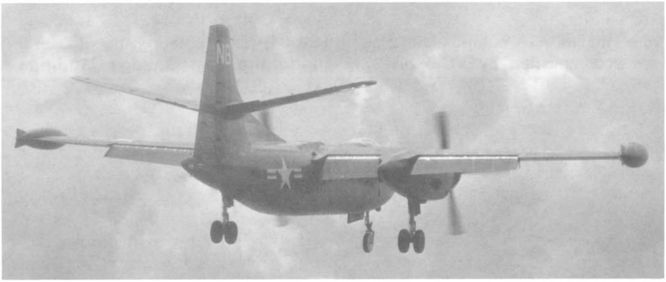
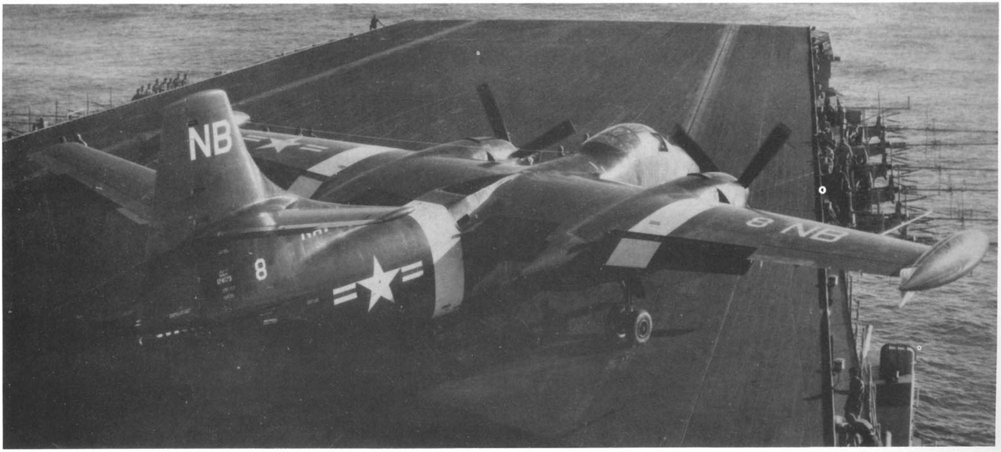
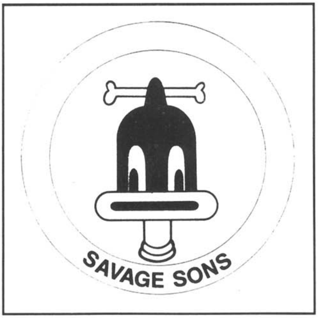
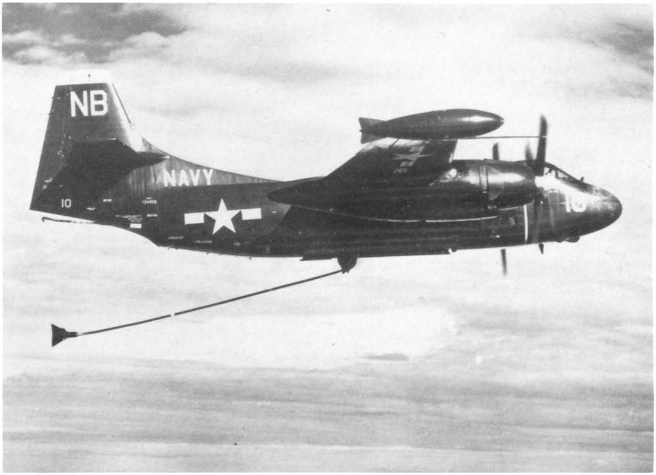


Previous page, VC-5 AJ-1s conducting the Savage's first complete carrier qualifications on 8-31-50 aboard the USS Coral Sea (CVB-43). Six AJ-1s were used with 124164 at top. This page, VC-5 AJ-1 124159 undergoing bomb loading tests at NATC Pax River in August 1950. At right, VC-5 AJ-1 overflies the deck of the USS F. D. R. (CVB-42) on 8-11-52. VC-5 AJ-1 124175 on the deck of the USS Midway (CVB-41) during operation Lant Flex 52. White stripes were used. (National Archives)









VC-5 was originally called the Grim Reapers, but was renamed the Savage Sons with the above insignia. At right, AJ-1 124855 with tanker package deployed and with retrofitted AJ-2 style tail prepairs to refuel carrier fighters. (National Archives)

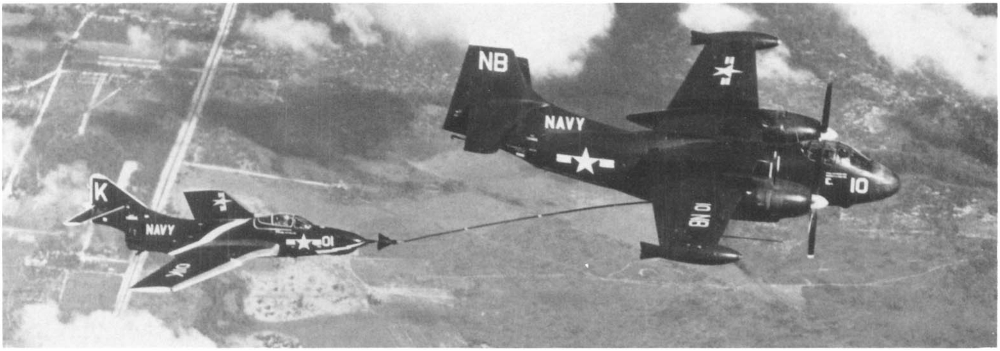
VC-5 deployed aboard the USS Franklin D. Roosevelt (CVB-42) while the detachment was assigned to Port Lyautey from 26 February to 11 March 1951. The first AJ-1 catapult launches were accomplished by VC-5 on 27 February when three Savages were launched on a mission. On 6 March AJ-1 124171 crashed following an in-flight fire which killed LCDR Maurice Wickendoll, flight surgeon LCDR Clyde Fairless Jr. and third crewman AT3 Ruben Lopez.

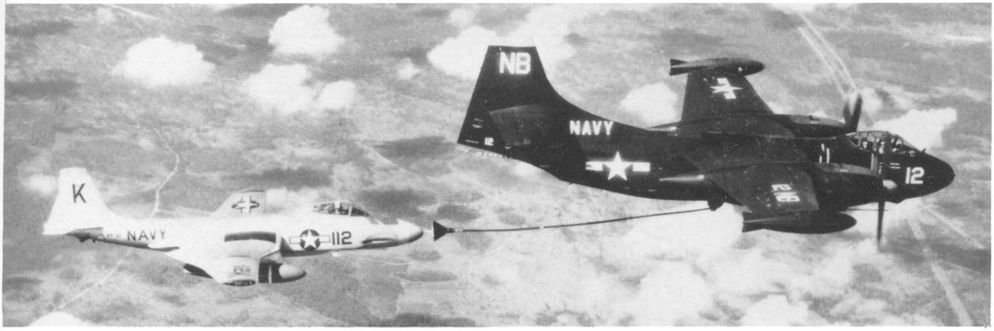
Following the FDR deployment the AJs were grounded for safety modifications which started on 11 March and were completed on 20 March. As each aircraft was converted the squadron concentrated on FCLP training in preparation for sending four aircraft aboard the Coral Sea on 20 March. On 25 May three squadron AJ-1s intercepted the USS Oriskany (CV-34) upon entering the Med and made the first Savage landings aboard an Essex class carrier.

During the aircraft overhauls of 11 March to 20 March, the hydraulic fluid on the Savages had been changed to a highly corrosive type called hydrolube. This fluid continued to cause complete and partial hydraulic failures. In addition electrical and fuel system failures were plaguing the AJ fleet and all AJs were grounded on 11 June. The squadron was replaced by VC-6 at Port Lyautey in late September 1951.

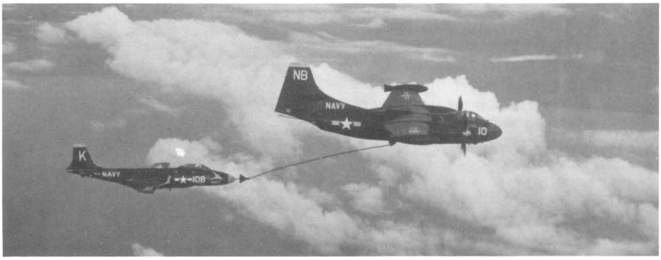
After returning to Norfolk, VC-5 transferred to NAS Jacksonville, Florida, in March 1952 to support the Mayport based Air Groups. Another Det deployed to Port Lyautey from October 1952 to April 1953 when the squadron transferred to NAS Sanford, Florida. This was followed by more fleet exercises and a deployment to Port Lyautey from October 1954 to February 1955. After returning to Sanford frequent tanker exercises were conducted prior to the squadron being redesignated Heavy Attack Squadron Five (VAH-5).

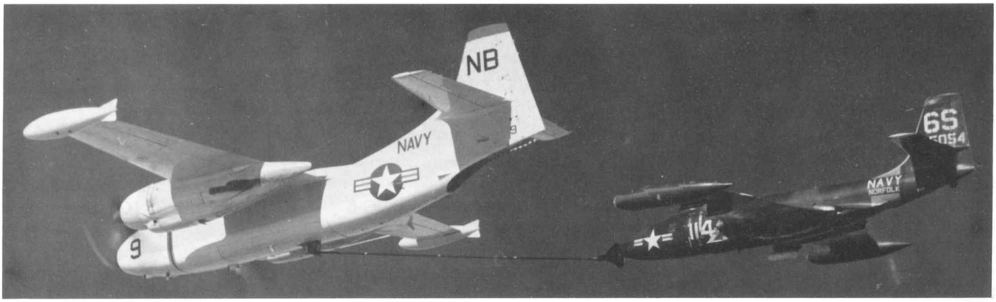
F9F Cougar tanking from 124855 on 10-12-55. Prop spinners and fin tip were red. The squadron insignia was painted on the fin tip. (National Archives)

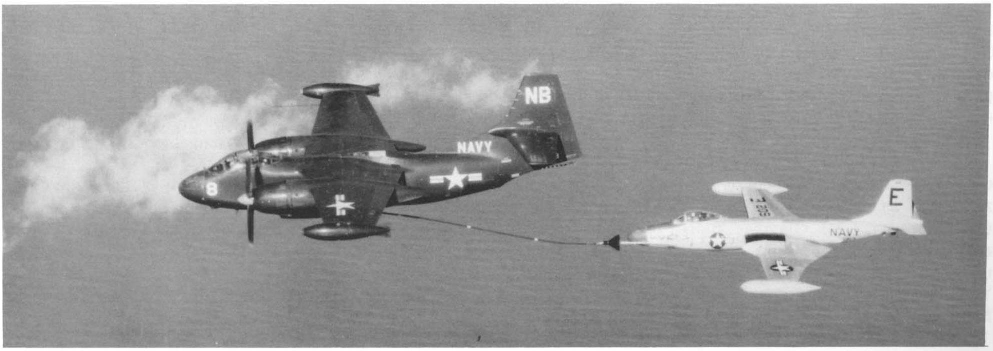




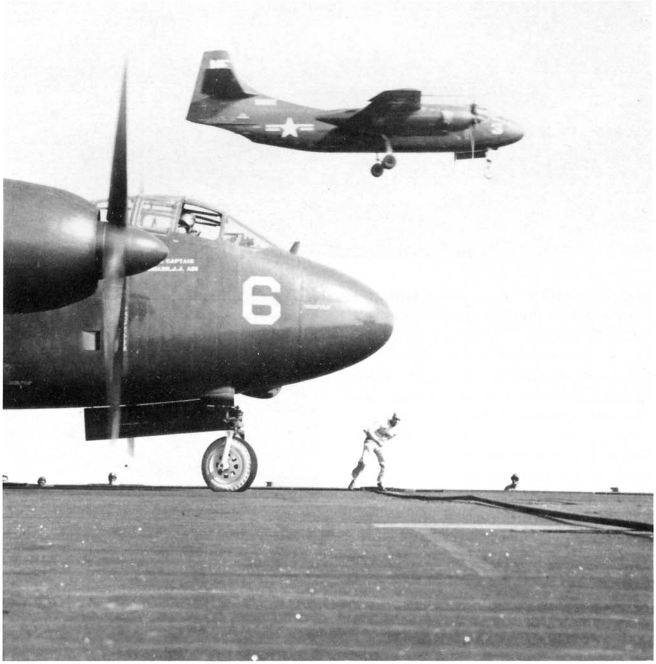
Above, retrofitted AJ-1 12/NB with red spinners and fin tip tops-off a natural metal F2H-3 from VF-31 on 10-12-55. The Banshee is carrying a T-63 shape. (National Archives) At right, AJ-1 124855 refuels a VF-31 F2H-3 on 10-12-55. (National Archives) Below, VC-5 Savage tanks a Norfolk reserve F2H-2. (USN) Bottom, VC-5 AJ-2 refueling a natural metal VC-4 F2H-4 Banshee from the USS Lake Chamolain (CVA-39) on 1-28-55. (National Archives)







COMPOSITE SQUADRON SIX, (VC-6)



VC-6 AJ-1s operating off of the USS Midway (CVB-41). AJ nose gears were painted white on the port side to enhance crew and deckhand safety. The AJ-1 had a one piece nose gear door as shown here. (NASM)

VC-6, the second squadron formed in preparation for the new AJ-1 Savage, was activated at NAS Moffett Field, California, on 6 January 1950. Initially equipped with P2V-2 and P2V-3C Neptunes, the squadron moved to NAS Patuxent River, Maryland, in late 1950 where it took delivery of its AJ-1s.

Six VC-6 pilots carrier qualified on the USS Coral Sea (CVB-43) along with VC-5 off of Cape Hatteras on 28 February 1951. Sixteen VC-6 crews were indoctrinated on the new MK-8 weapon. Then on 14 and 15 May twenty-five squadron pilots qualified aboard the USS Midway (CVB-41). The weapons capability was once again upgraded in June with a new type universal wiring and flight test equipment for the MK-6 weapon. This gave VC-6 the ability to deliver MK-4, -6, and -8 weapons.

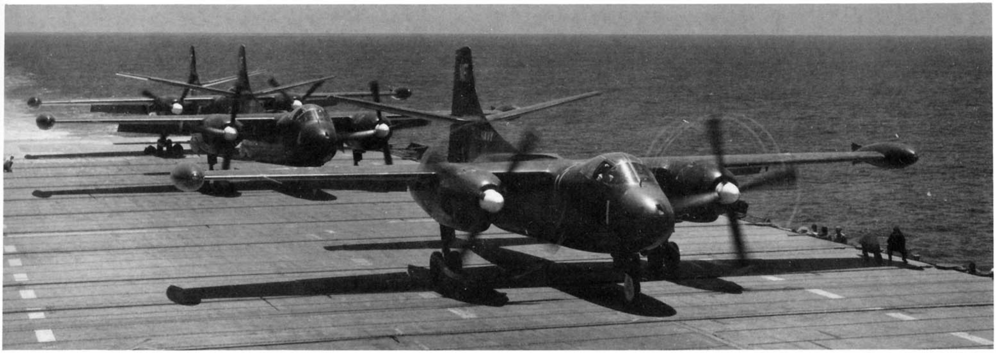
The growing strategic attack community needed a parent organization and Heavy Attack Wing One (HATWINGONE) was commissioned at NAS Norfolk, Virginia, on 1 February 1951. HATWINGONE deployed VC-6 to NAF Port Lyautey, French Morroco, from October 1951 until April 1952. The squadron deployed nine AJ-1s and two P2V-3Cs to give the Sixth Fleet a nuclear punch.

While deployed to the Med. VC-6 conducted simulated bombing attacks on the Sixth Fleet, actual bombing practice on Fillfla Island, refresher carrier qualifications aboard the USS Midway , bombing practice at Ksar Es Souk, and special weapon loading exercises aboard Midway. The Midway's Special Weapons Unit proved during these tests that it was possible to load the Mk-4 weapon in the AJ while aboard ship.

After being relived by VC-7, VC-6 returned to the Continental United States (Conus) and Pax River in April 1952. In June the squadron sent Detachment One to NAS San Diego (North Island), California, to operate from Oriskany configured carriers in the Pacific Fleet. The Det consisted of four AJ-1s, one P2V-3C, six crews and the needed support equipment and personnel to be self- sufficient. The rest of the squadron transferred to San Diego on 31 October, thus dissolving the Detachment. During 1952 the squadron qualified aboard the USS Kearsarge, practiced with MK-5, MK-7 and MK-8 weapons and was briefly attached to NAS Barber's Point, Hawaii.

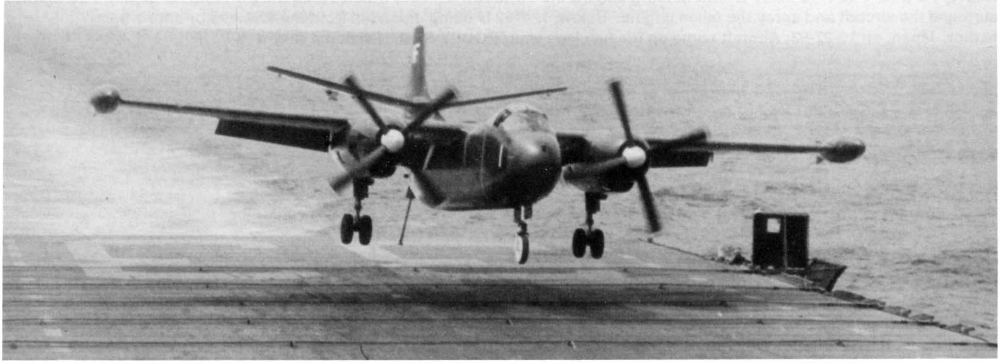
In July 1953 a VC-6 Detachment was stationed at the Korean air base K-3. The Det was armed with nuclear weapons and was used as a deterrent to the communist forces.

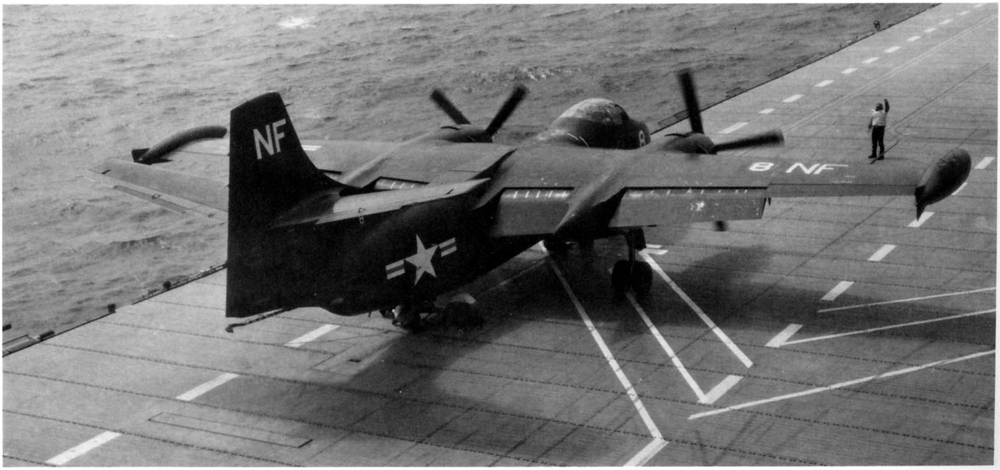
The next four years saw numerous deployments as Detachments aboard West Coast carriers. During this period many new techniques evolved for the handling of heavy attack aircraft. The squadron was redesignated Heavy Attack Squadron Six (VAH-6).

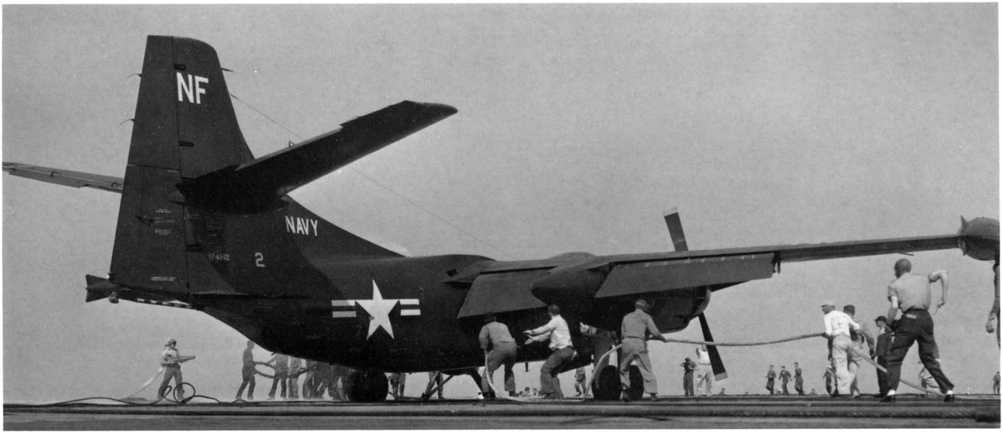


Above and below, VC-6 AJ-1s operate off the USS Kearsarge (CVA-33) in July 1952 with white prop spinners. (National Archives)

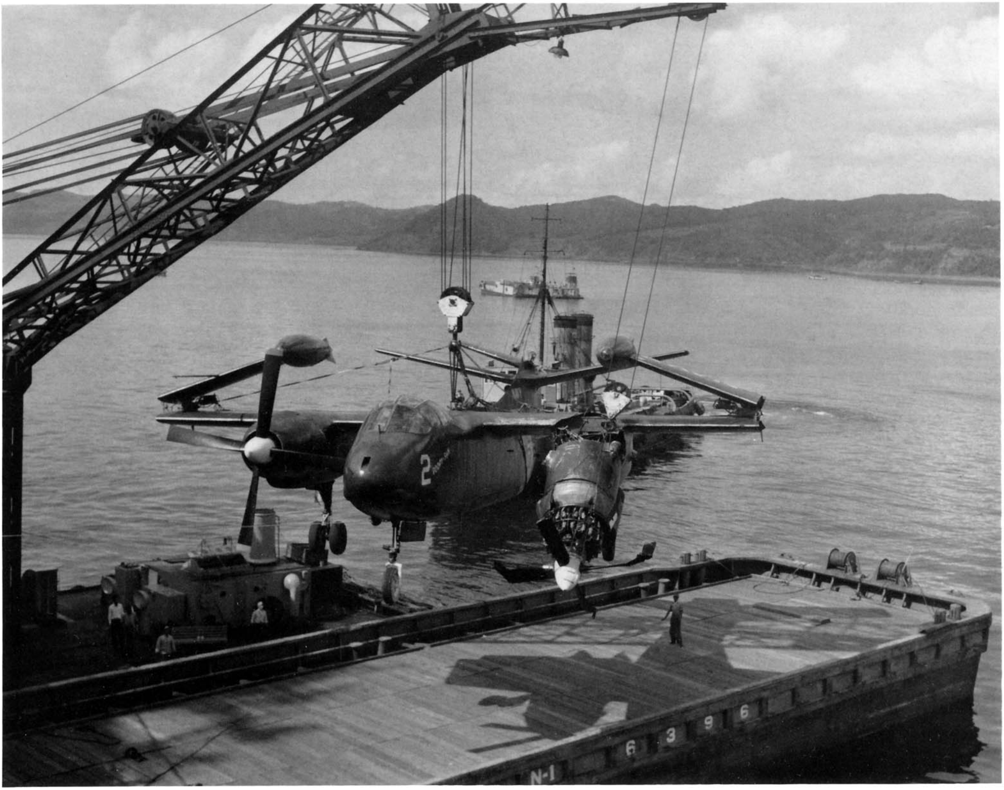
VC-6 AJ-1 prepares to launch off the port catapult of the USS Yorktown (CVA-10) on 4-16-53. Note location of the wing codes. (National Archives)

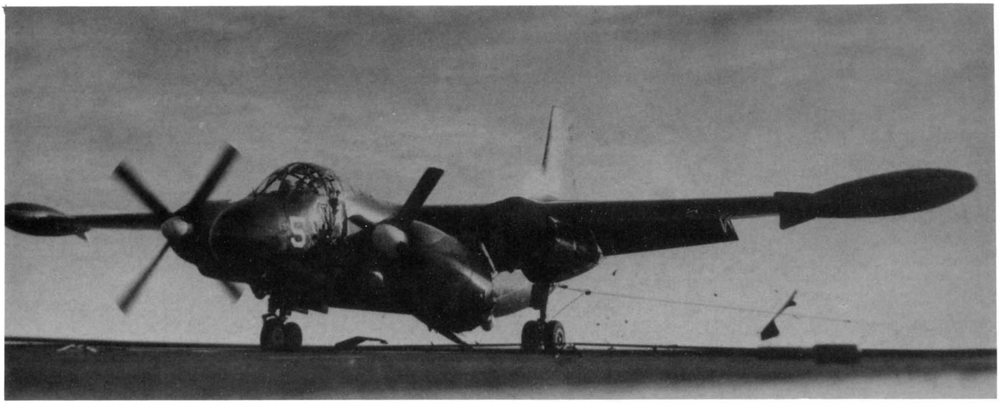






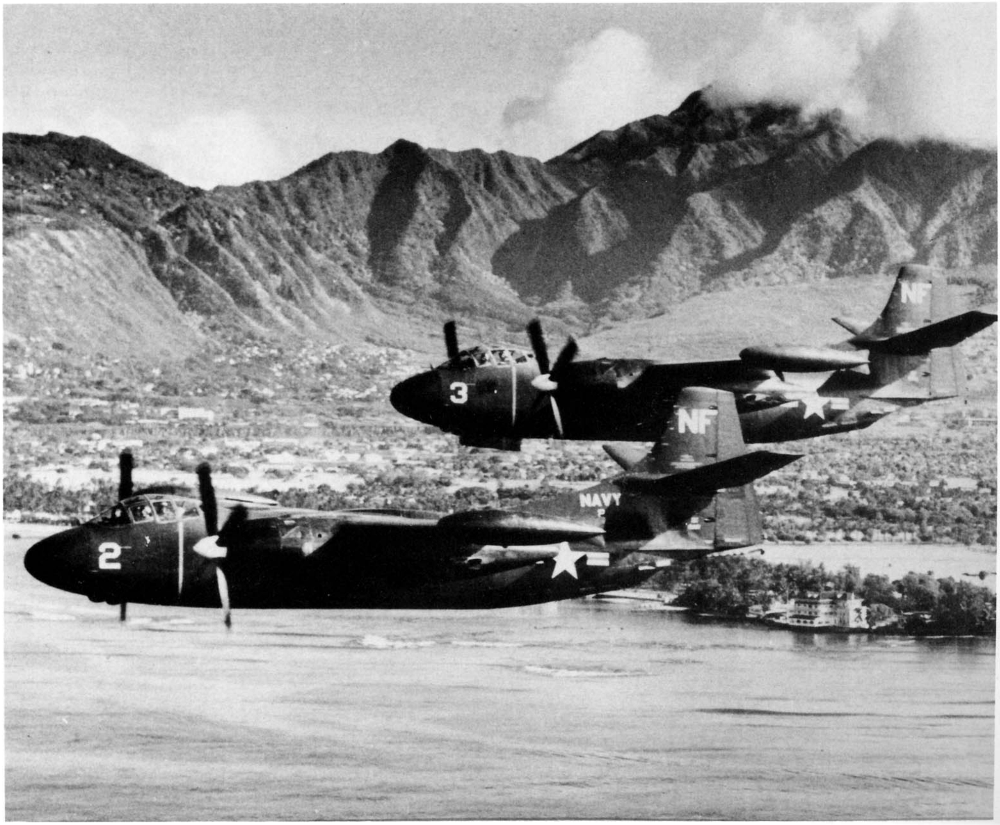
Above, VC-6 AJ-1 124162 made a hard landing aboard the Yorktown in 1953, which broke the port engine mount. Fire fighters surround the aircraft and spray the fallen engine. Below, 124162 is being unloaded from the #2 elevator onto a barge in Sasebo harbor, Japan, on 10-22-53. Aircraft name on the fuselage was "POOPY-SAN". (National Archives)

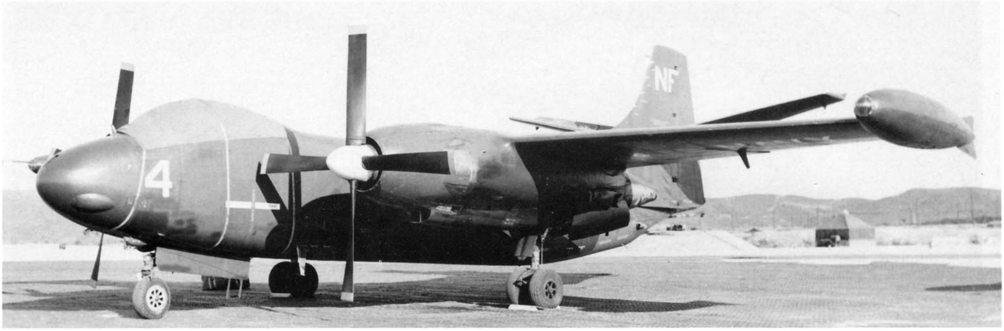




VC-6 AJ-2 lands hard on the USS Essex (CVA-9) on 11-10-53. The engine completely breaks away from the firewall and drops to the deck, but not before a prop blade cuts into the fuselage. The impact also caused the tip tank to break away. (National Archives)

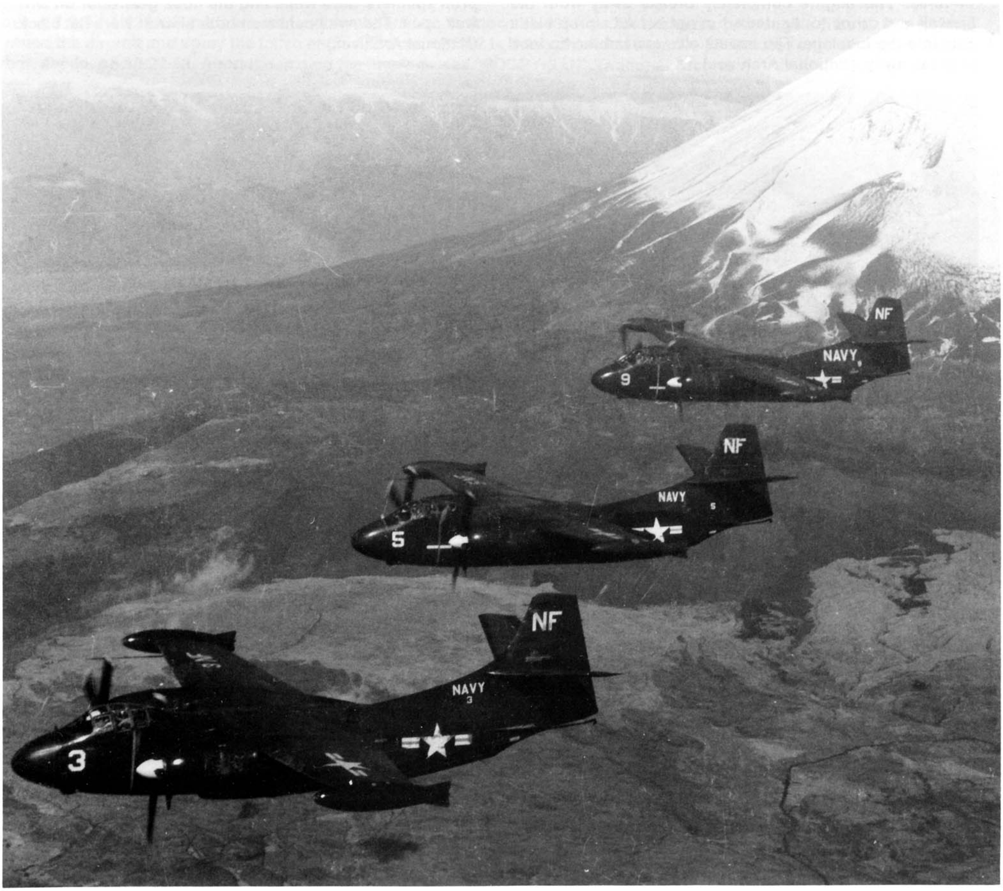
Two VC-6 AJ-1s off the coast of Hawaii, date unknown. The prop spinners were white and the nose gear door on 3/NF was open. The nose cones on both aircraft were flat black. (National Archives)

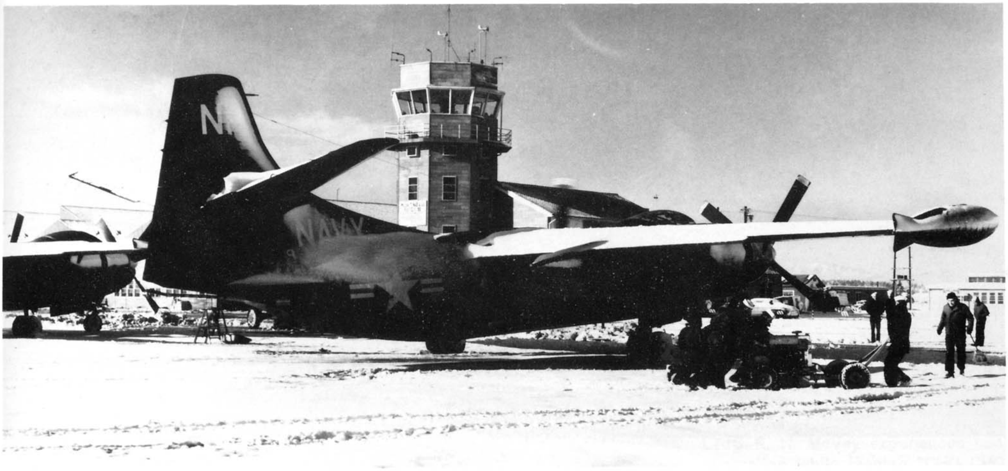




VC-6 AJ-1 sits at the K-3 airstrip in South Korea during 1953, when the squadron maintained a detachment on alert in case a nuclear response would be needed. (Clay Jansson)

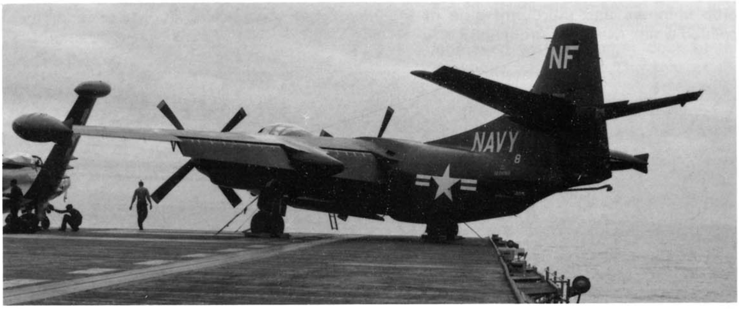
Below, three VC-6 AJ-1s pass over Mount Fuji in Japan during the 1953-54 period. Note location and size of the wing codes. (via Pace)

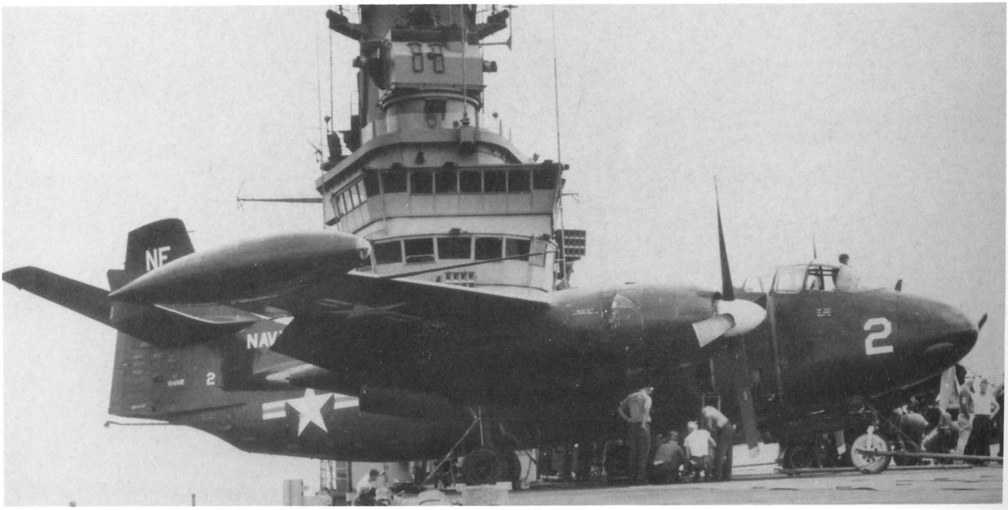


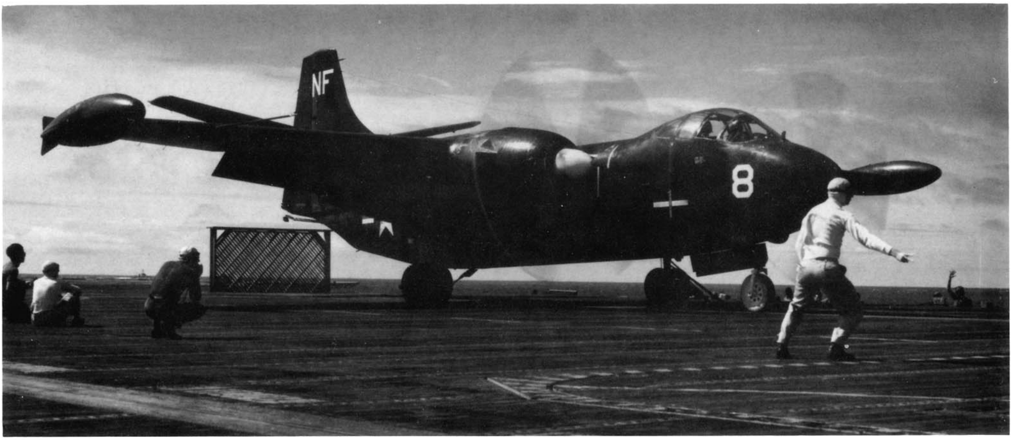


VC-6

Above, two VC-6 AJ-1s during a stop-over in Alaska. (via Pace) At right, VC-6 AJ-1 122599 tied down to the forward deck of the USS Lake Champlain while off the coast of Korea on 8-14-53. Below, VC-6 AJ-1 124162 was also assigned to CVA-39 on 8-14-53. The aircraft is spotted with the tail hanging off the deck. (National Archives)

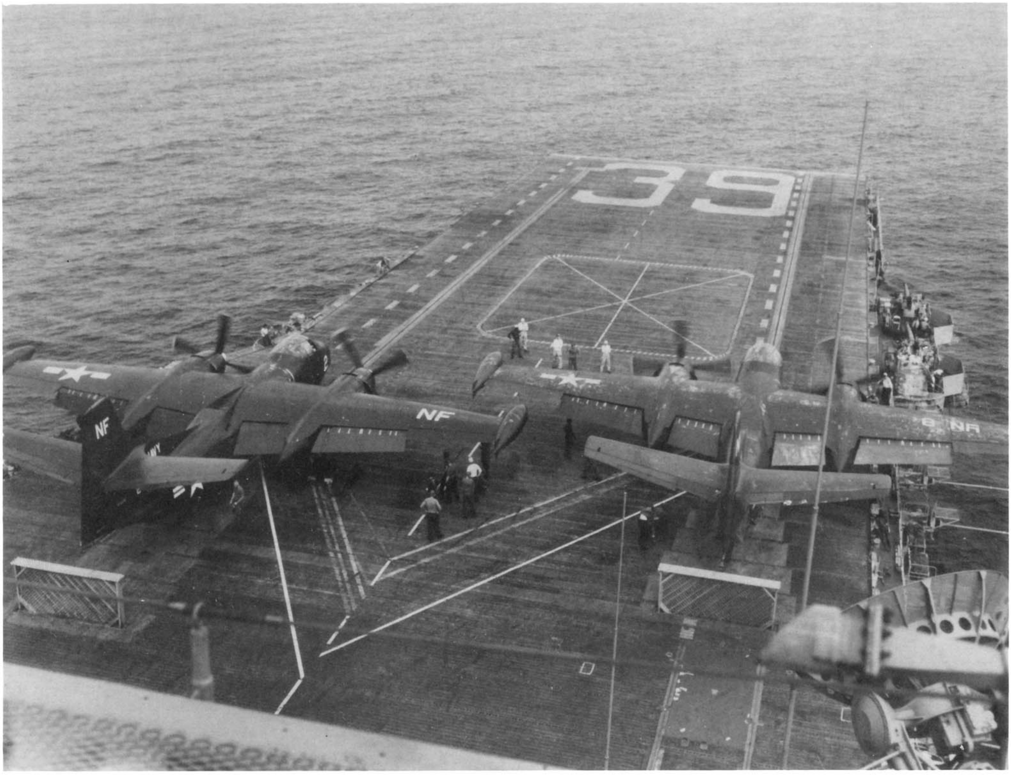


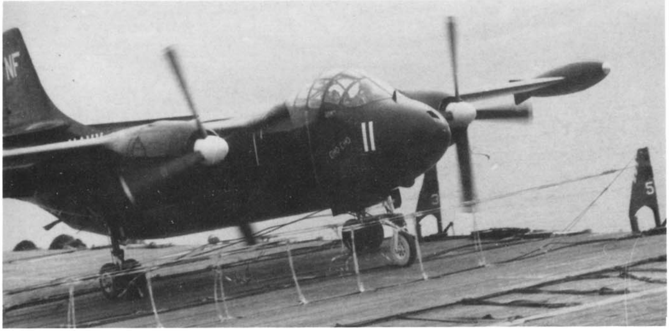


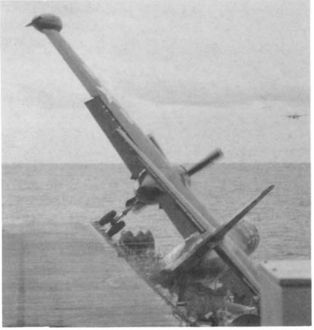


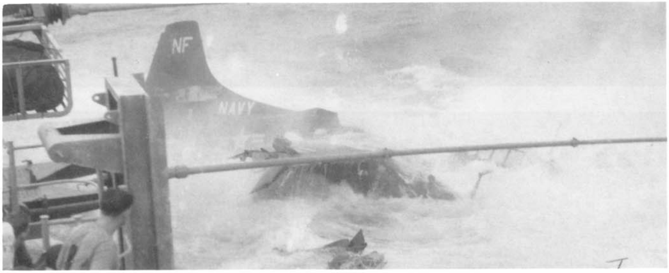
VC-6 AJ-1 122599 starts a catapult launch from the "Champ" (CVA-39) on 8-14-53. The escape windows were open and the prop spinners and starboard side of the nose gear was painted white. (National Archives)

122599, again, prepares to launch from the starboard "Cat" while 124162 waits on the port catapult. The wings of the two aircraft overlap each other when positioned for launch on the Essex class carriers. (National Archives)



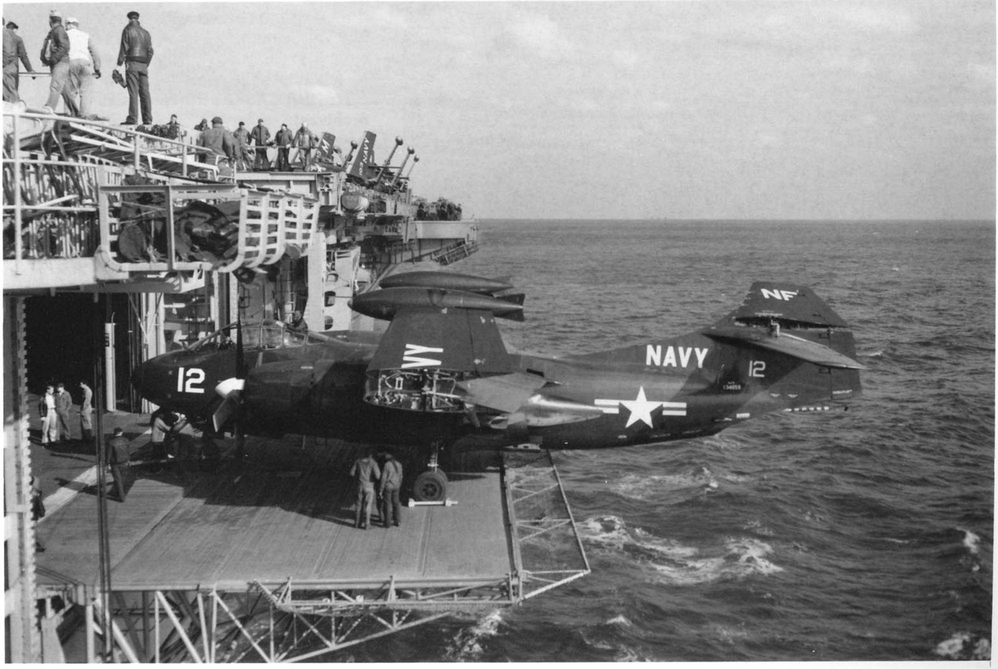


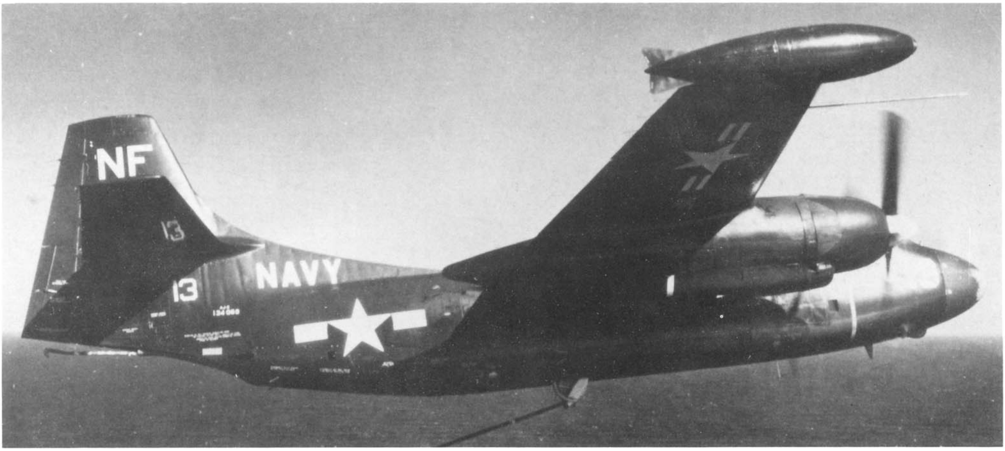


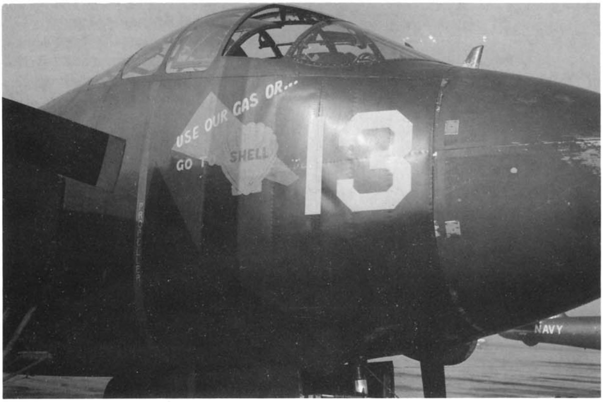


VC-6 ON YORKTOWN

Above and at left, VC-6 AJ-2 flown by LTJG K. H. McVay experiences hook separation while landing "CHO CHO" aboard the USS Yorktown (CVA-10) on 8-6-54. (National Archives) Below, VC-6 AJ-2 134058 hangs over the ocean as it is moved to the hangar deck of the Yorktown on 2-8-54. The rear of the engine nacelles aft of the exhaust stacks was polished metal on this aircraft. (National Archives)







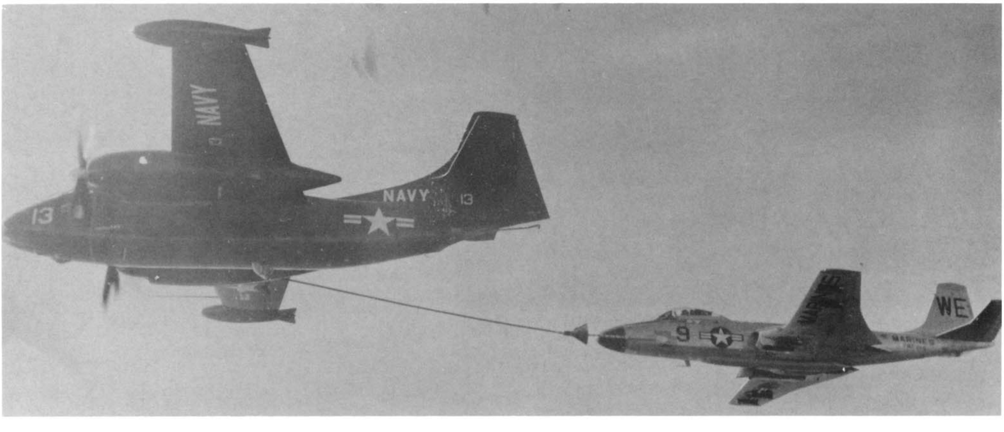
VC-6 TANKERS

In November 1954, VC-6 conducted refueling training with Hawaiian based carriers and Marine and Navy squadrons. AJ-2 134089 took part in these exercises and is illustrated on this page.

Above, 134089 with hose deployed. (via Howard Fromm)

At left, the nose art on 134089 which says "USE OUR GAS OR GO TO SHELL". (National Archives)

Below, 134089 is seen refueling a Kaneohe based F2H-4 Banshee assigned to VMF-214. (via Howard Fromm)

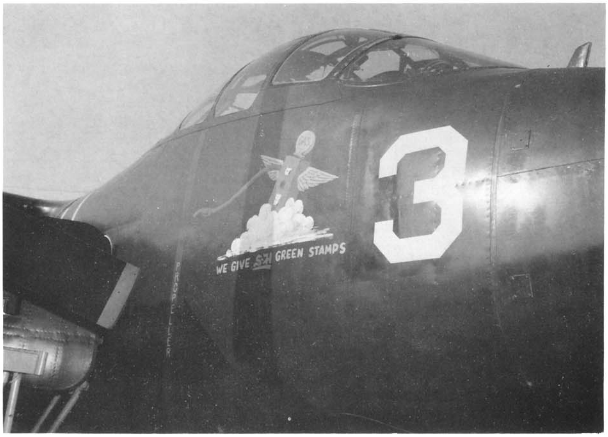


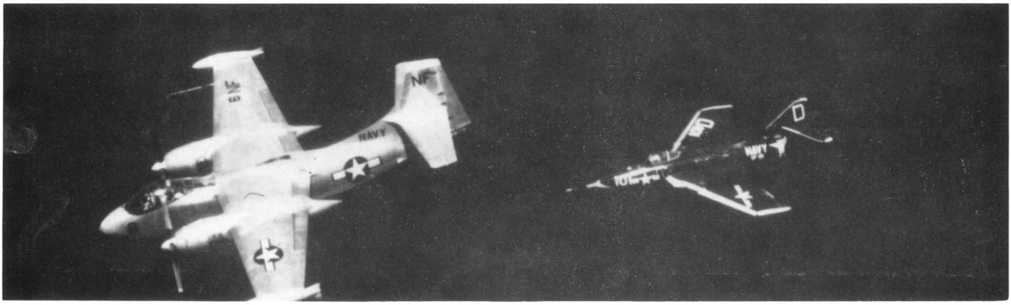
VC-6 TANKERS

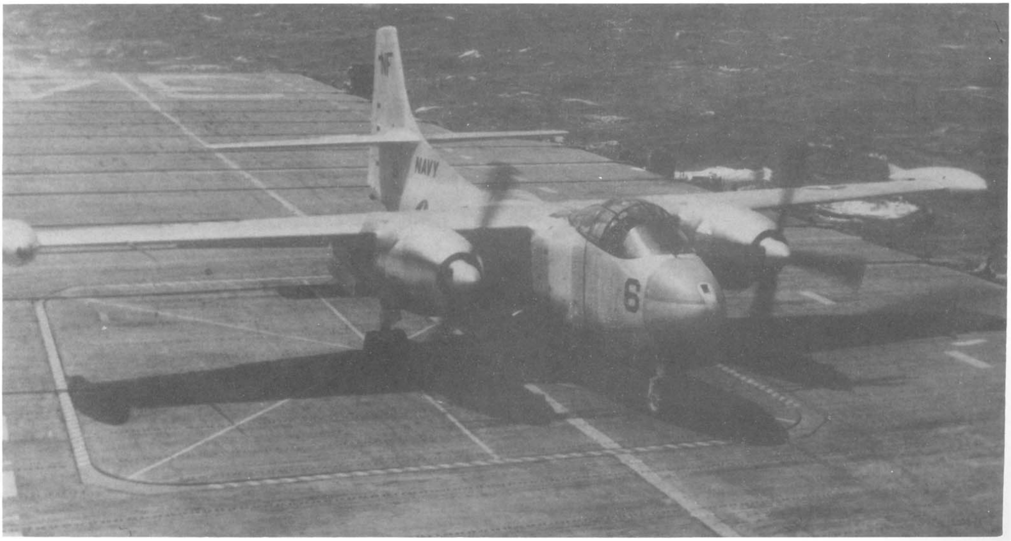
At right, another VC-6 AJ-2 with nose art in November 1954. Nose art shows a flying gas pump with "WE GIVE S&H GREEN STAMPS". (National Archives)

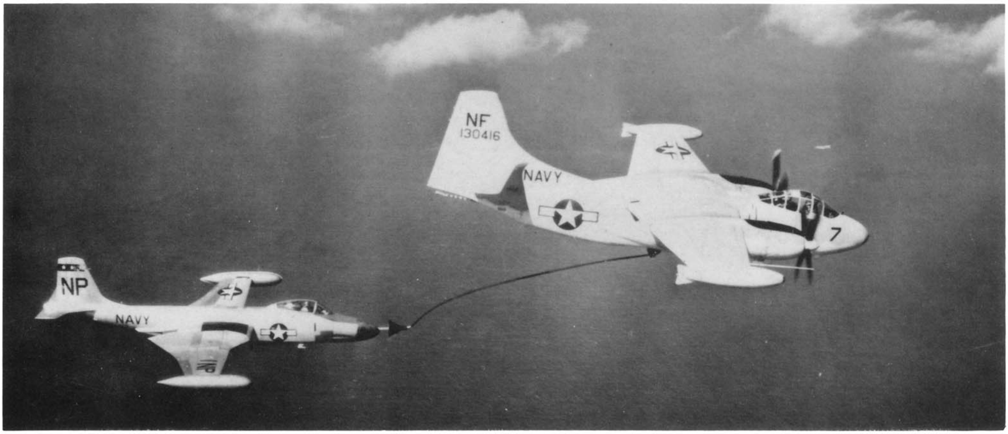
Below, natural metal AJ-2 from VC-6 refuels a VF-121 F9F-8 Cougar on 6-15-55. (National Archives)

Bottom, the same natural metal AJ-2 on the deck of the USS Oriskany (CVA-34) on 3-11-55. The canopy framing appears to be dark blue. The reason for this aircraft being natural metal is not known. (USN/Tailhook)

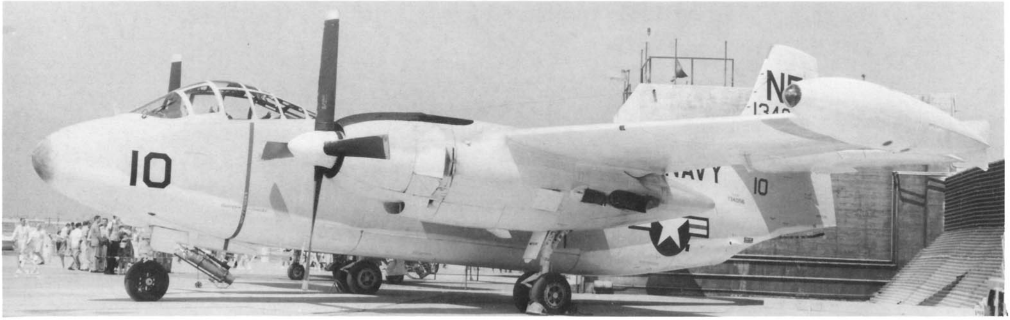


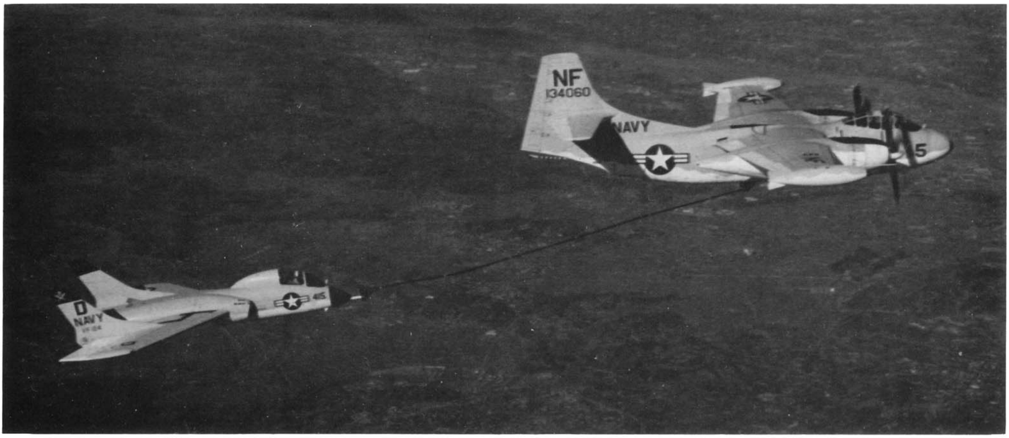




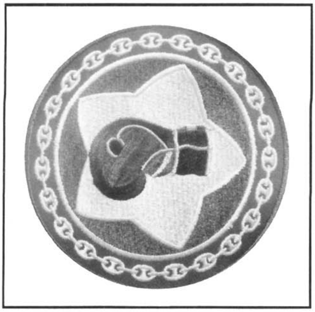


Above, grey and white VC-6 AJ-2 130416 assigned to Task Force 77 refuels a VC-3 F2H-3 Banshee in October 1955. (National Archives) Below, VC-6 AJ-2 134056 at Mines Field, California, on 6-24-56. Bottom, VC-6 AJ-2 134060 refuels a VF-124 F7U-3. Prop spinners were white and the tops of the engine nacelles were black. (USN)



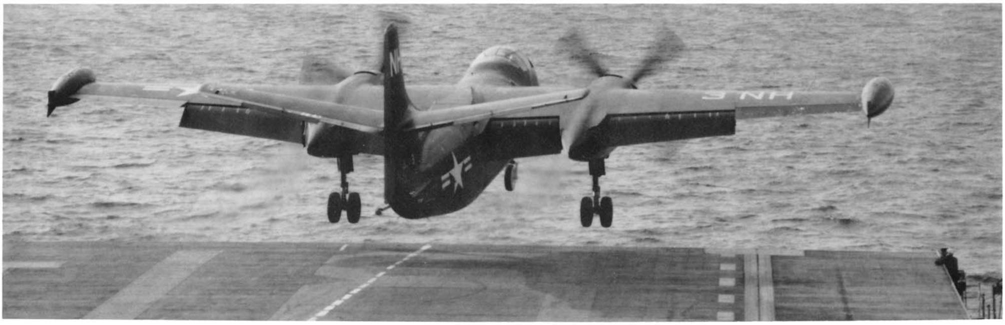


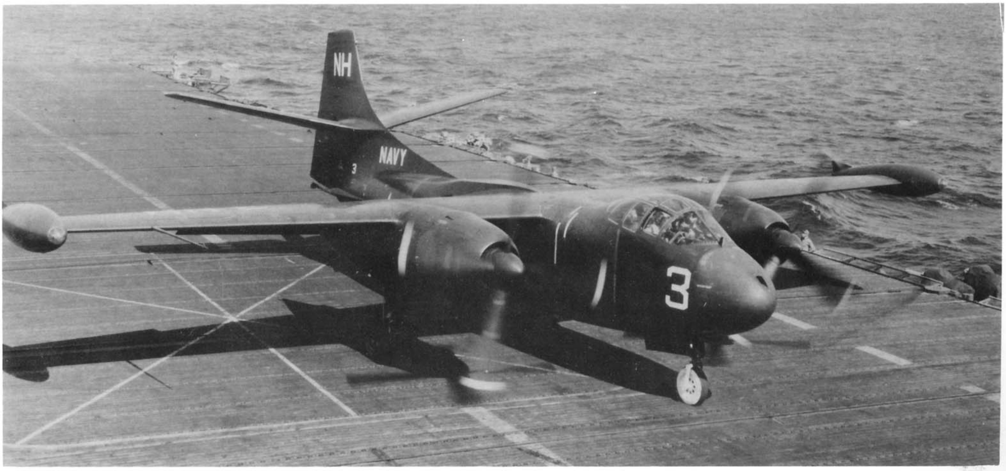
COMPOSITE SQUADRON SEVEN, (VC-7)



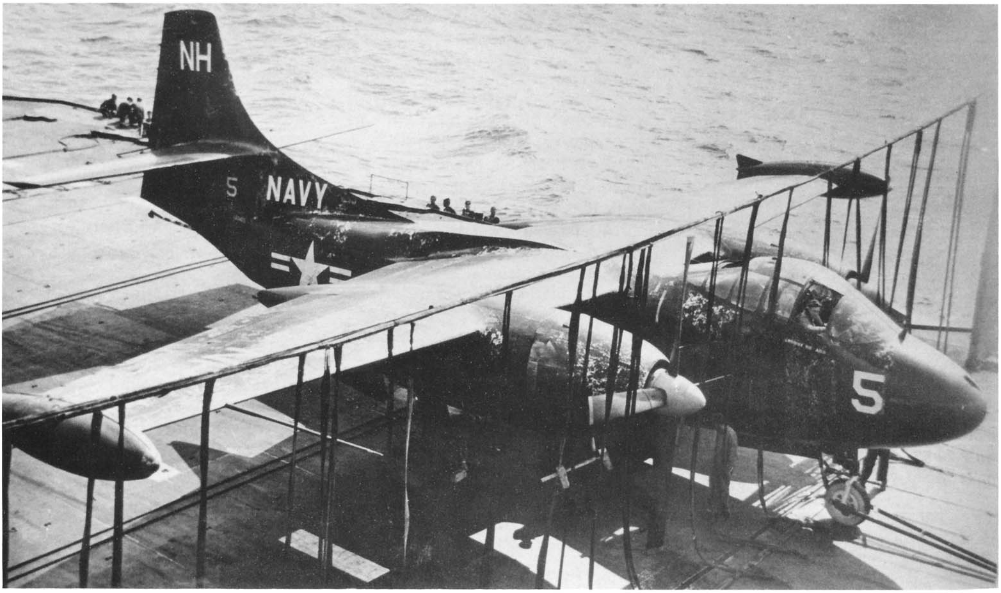
Composite Squadron Seven (VC-7) was established at NAS Moffett Field, California, on 10 August 1950 and was initially equipped with P2V-2 and P2V-3C Neptunes. Since the squadron wasn't slated to receive AJ-1s until April 1951, in the interim four AD-1s were brought on-board to give the squadron a temporary carrier capable special weapons platform. The ADs were only operated for a couple months prior to the squadron receiving orders in May 1951 to NAS Norfolk, Virginia. The AJ-1s were finally delivered in June, but could not be operated due to a Navy-wide grounding on 11 June. All of the squadron's AJ-1s went through the phase one modification program and it was not until October 1951 that AJ-1 flight operations were able to resume.

The squadron's AJ-1s participated in LANTFLEX-52 and conducted carrier qualifications aboard the Midway in December 1951 and aboard Wasp in February 1952. The first deployment to Port Lyautey took place on 11 April 1952 with both P2V-3Cs and AJ-1s. This deployment lasted until 15 October and on 1 November 1952 the squadron was transferred to NAS Patuxent River, Maryland. Then, in early 1955, the squadron moved to NAS Sanford, Florida, where VC-7 was redesignated Heavy Attack Squadron Seven (VAH-7) on 1 July 1955.

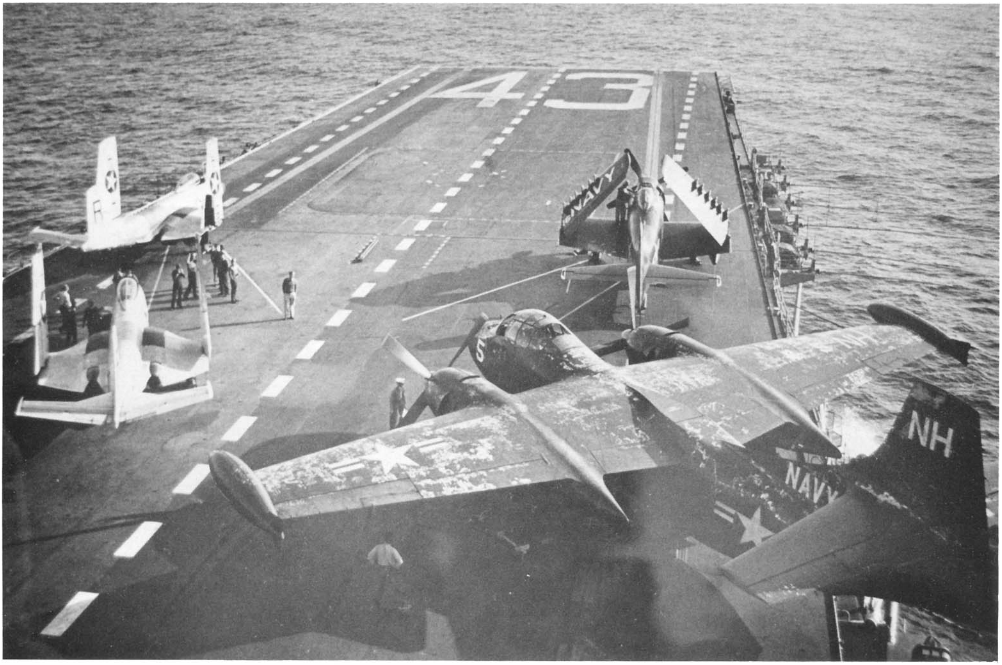




VC-7 AJ-1 3/NH during carrier qualifications from the USS Wasp (CVA-18) on 2-29-52. The starboard side of the nose wheel was white. (USN)

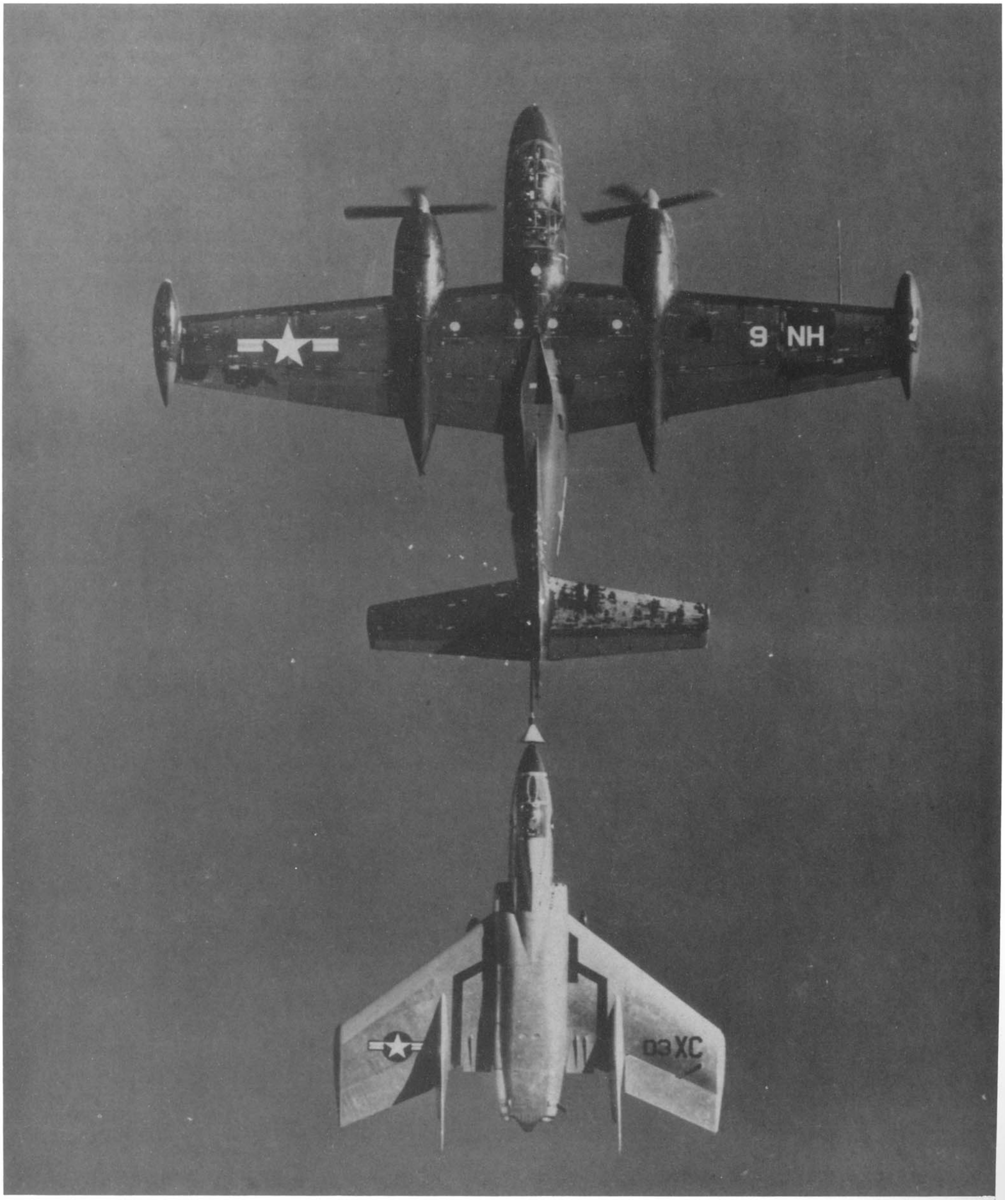


VC-7 AJ-2 aboard the USS Coral Sea in March 1955. The prop spinners were red and the blue paint is peeling off in sheets. (USN)

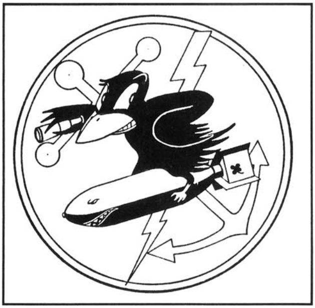


COMPOSITE SQUADRON SEVEN TANKERS

VC-7 AJ-2 9/NH refuels a VX-3 F7U-3 on 4-18-55. Like the VC-7 Savage on the previous page, this aircraft's paint is peeling off. The prop spinners are red as are the five fuel cap locations painted on the wing's center section and forward fuselage. (USN)



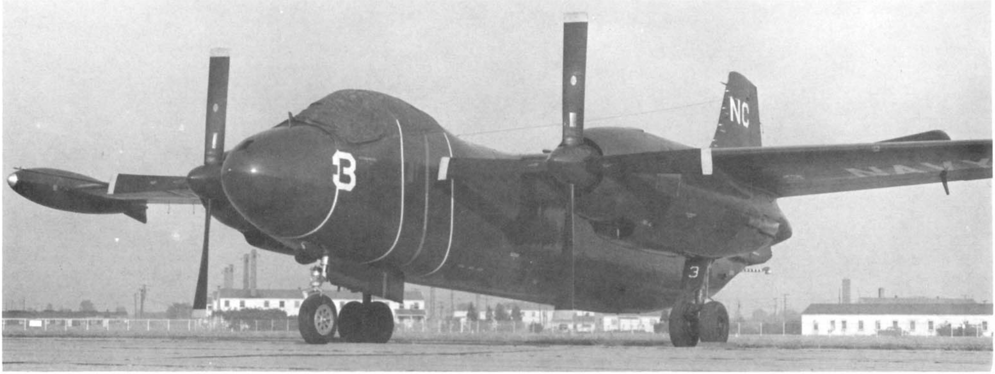
COMPOSITE SQUADRON EIGHT, (VC-8)

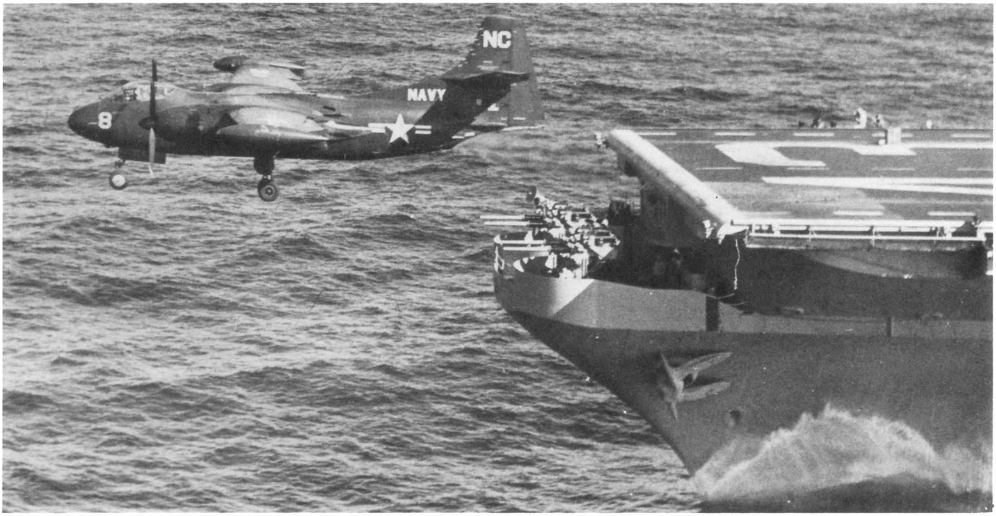


Composite Squadron Eight (VC-8) was established on 3 December 1951 at NAS Patuxent River, Maryland. VC-8 was initially equipped with three P2V Neptunes and five AJ-1 Savages.

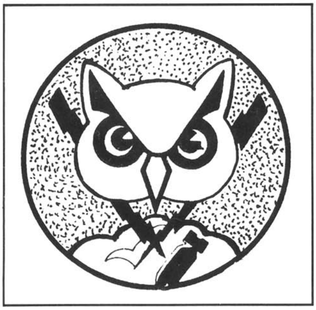
As with the other East Coast squadrons, VC-8 rotated to Port Lyautey and Sixth Fleet carriers. In July 1955 the squadron was transferred to NAS Sanford, and was redesignated Heavy Attack Squadron Eleven (VAH-11) on 1 November 1955. Under the reorganization that redesignated VC squadrons to VAH squadrons, all East coast squadrons became odd and all West coast squadrons became even. Thus VC-8, an East Coast squadron, was designated VAH-11 because VAH-8 would have been a West Coast designation.

Below, VC-8 AJ-1 124852 in 1952 at Pax River with silver nose wheel and strut. (Lionel Paul) Bottom, VC-8 AJ-1 leaves the bow of the USS Coral Sea in 1953. (NAA via Bob Lawson)





COMPOSITE SQUADRON NINE, (VC-9) "HOOTERS"



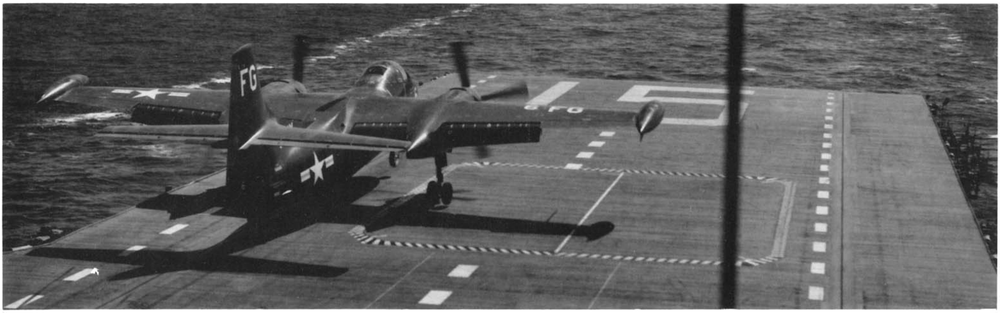
VC-9 was established on 1 January 1953 at NAS Sanford, Florida, with a compliement of sixty men, two TBM-3Es and one P2V-2. Shortly thereafter these were replaced by the "Able Jigs" and two P2V-3Cs. The squadron claimed to be the first VC squadron to operationally test the Savage in the tanker role when VF-31 F2H-3s were refueled while operating off the Midway. In 1954 the squadron deployed to Port Lyautey and on 1 November 1955 VC-9 was redesignated VAH-9.

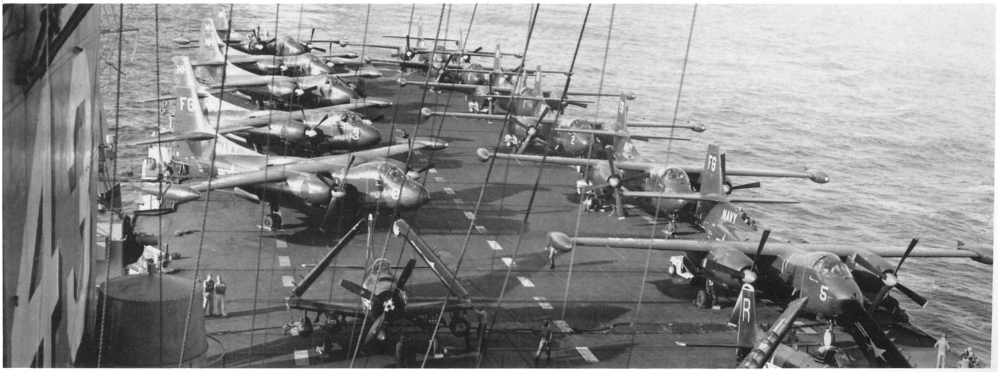
VC-9 AND THE SAVAGE
BY BILL THOMAS

"The AJ had a J-33 in the tail, and in its early years our guys used to have fun with Air Force dudes flying their jets. The AJ with two turning and one burning would slide up alongside the USAF birds and shut down both recips while staying in position. This caused much wonderment to the unsuspecting USAFers.

"The AJ was unarmed, of course, but being a plumber's nightmare they always carried many cans of Hydrolube in the cabin, as well as some aluminum chain. Some of our flight crews practiced for doing away with an enemy fighter on their tail by dumping the chain & cans onto the bomb bay doors & then popping them open at just the right time.

"We had some classic stars in our community. One flew out to the carrier from the beach, circled the ship & cycled the bomb bay doors before coming aboard. He forgot that we had stowed all the crew's luggage, including his, on the bomb bay doors! I'm told that this same AJ driver is the one who made a beautiful landing at Sanford, pulled back on the recips and kept right on speeding off the runway & thru the fence because he neglected to idle the jet!"





VC-9 AJ-2 lifts off from a deck run on the USS Randolph (CVA-15) during NATO exercises off Naples on 7-19-54. Bottom, six VC-9 AJ-2s with FG tail codes and red prop spinners share the Coral Sea's deck with VC-7. (USN)

HEAVY ATTACK SQUADRON FIVE, (VAH-5) "SAVAGE SONS"

HATRON FIVE
SAVAGE SONS

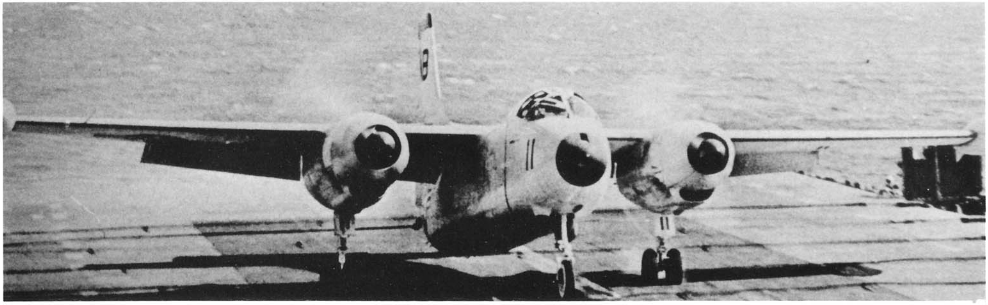
Heavy Attack Squadron Five (VAH-5) was established on 1 November 1955 at Sanford when VC-5 was redesignated VAH-5. In May 1956 the "Savage Sons Of Sanford" made a Sixth Fleet deployment with the Savage. Then in the spring of 1957, VAH-5 won the first Heavy Attack Wing One (HAW-1) Bombing Derby. The squadron won the second Derby in October, but with the A3D as the Savage had been phased out during the summer of 1957.

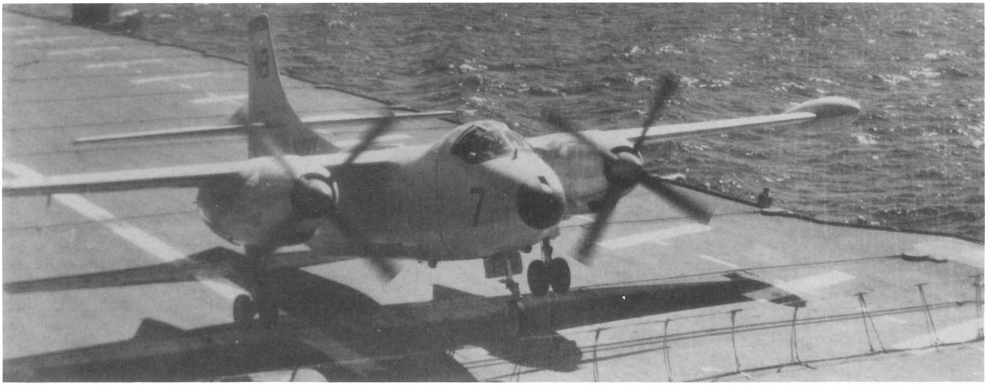
VAH-5 became RVAH-5 on 1 March 1964 when the A3Ds were replaced by the RA-5Cs. The squadron stood down on 30 September 1977 when the RA-5C program was terminated.

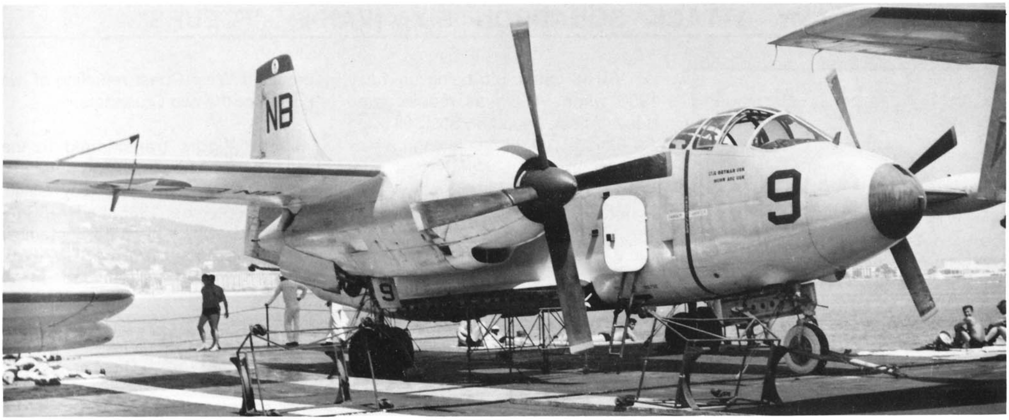
VAH-5 AND THE SIXTH FLEET
C. R. TUCKER

"AJ squadrons would deploy to Port Lyautey and then send detachments aboard the carriers in the Med. This was sort of an on again-off again sort of routine as the AJs were far from welcome aboard ship. They were big, had manual wing folding mechanism, leaked hydraulic oil all over the deck, went down frequently, and loused up the launch. They always were the last to come aboard and just in general did not fit in with the CAG's and the Air Boss's idea of "looking good" around the ship. I never have known any CAG or Air Boss with any Heavy Attack background, they were all fighter jocks. Another factor that made them heavy orphans was that they were not considered part of the Air Group-usually they didn't Car Qual with them, they did not deploy from the states with them, and the CAG didn't know the CO or OIC as well as the other squadron COs. Frankly, the AJs were as welcome as a fox in the hen house. If it wasn't for the insistance of the CARDIV staff they probably would not have been aboard at all."

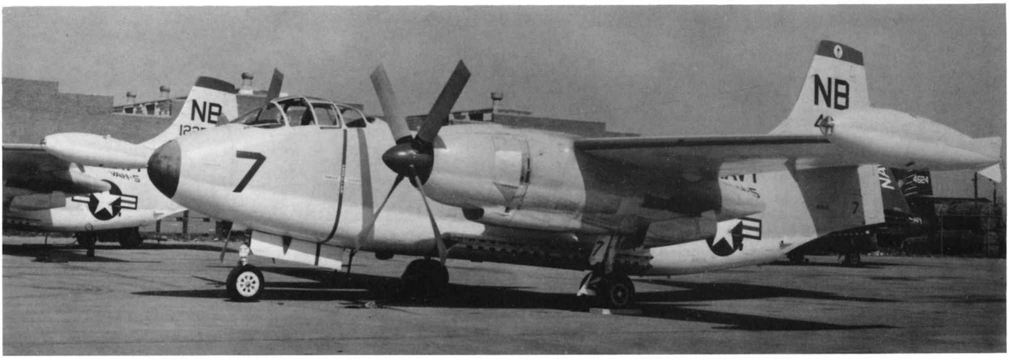
Below, VAH-5 AJ-1 11/NB lands aboard CVA-11 in July 1956. Bottom, VAH-5 AJ-1 hits the barrier on 9-8-56 aboard the CVA-43. (USN)

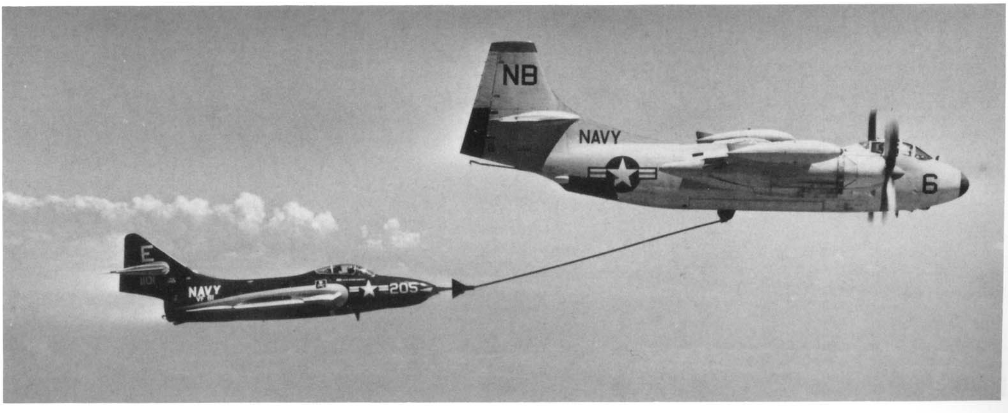






Above, VAH-5 AJ-1 aboard the USS Intrepid (CVA-11) in 1956. Prop spinners and fin tip were red. The fin tip also has the squadron insignia painted on it. (via S. Nicolau) Below, VAH-5 AJ-1 124170 at Norfolk in May of 1957. All of VAH-5's Savages shown on these two pages were AJ-1s retrofitted with AJ-2/2P tail groups. (National Archives) Bottom, VAH-5 AJ-1 with a blue lower rudder and aft fuselage panel refuels a VF-61 F9F-8 Cougar assigned to the Intrepid in July 1956. (National Archives)





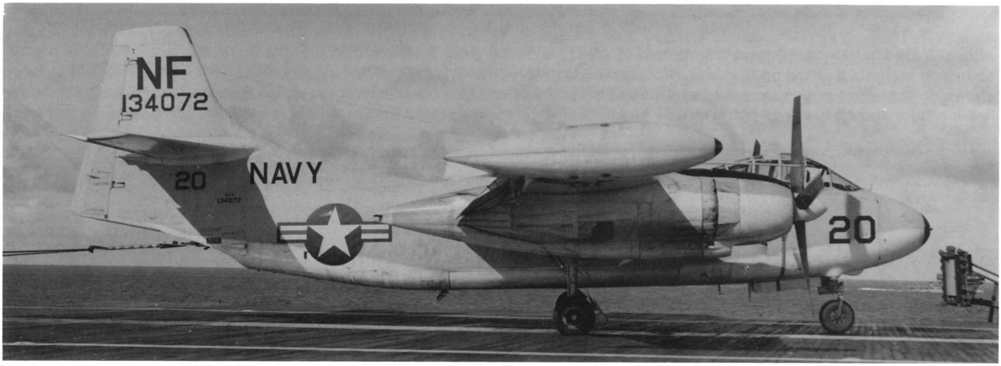
HEAVY ATTACK SQUADRON SIX, (VAH-6) "FLEURS"

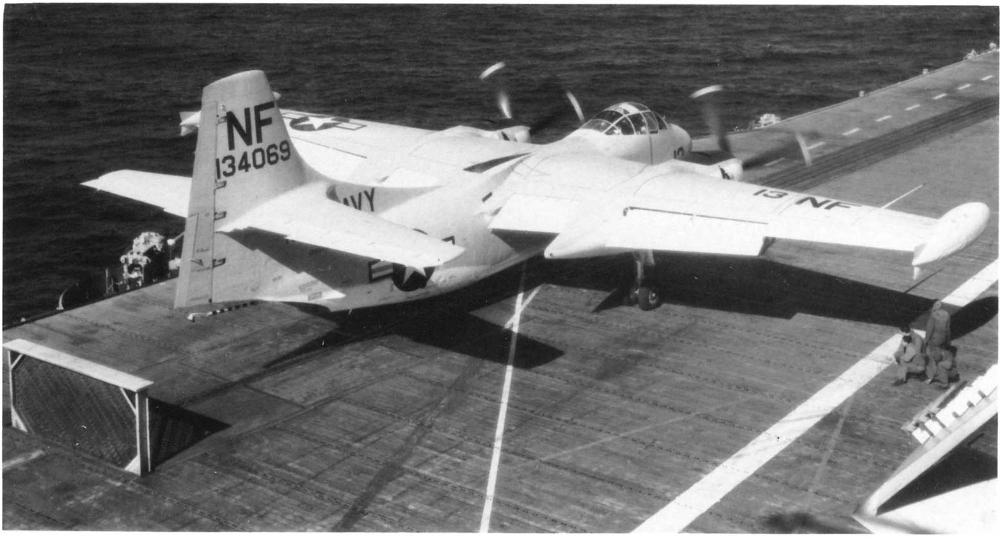
VAH-6 came into being on 1July 1956 when VC-6 was redesignated Heavy Attack Squadron Six. Still flying the Savage, VAH-6 maintained a permanent rotating detachment at NAS Atsugi, Japan, in addition to its NAS North Island home port. Flying the improved AJ-2, the squadron's assets had increased to twenty-six aircraft.

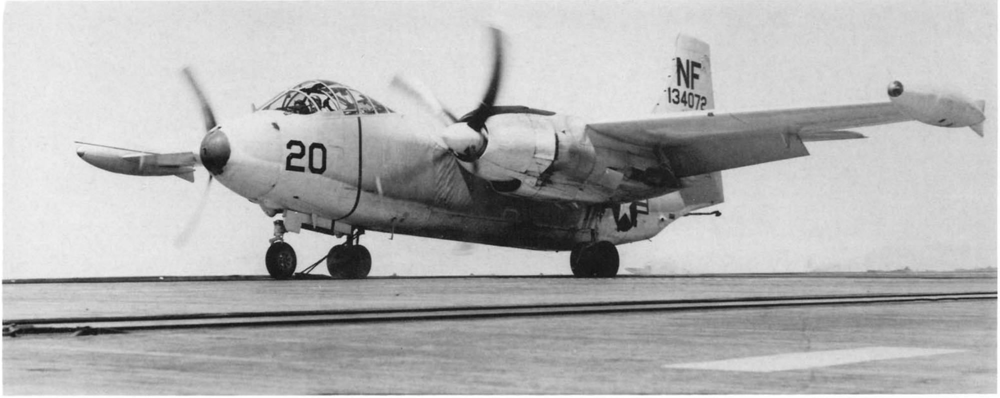
In addition to the five carrier detachments supplied in 1956-57, VAH-6 participated in Project Bullet. During the 15th. and 16th. of July 1957 VAH-6 provided West Coast refueling at two points for the two Crusaders.

The Fleurs transitioned to the A3D-2 in early 1958 and changed home base to NAS Whidbey Island. On 16 September 1965 the RA-5C replaced the A3D and on 23 September the squadron became RVAH-6. RVAH-6 was disestablished on 20 October 1978.

VAH-6 AJ-2 134072 lands on CVA-16 on 7-18-56. AJ-2 134069 prepares to launch from CVA-9 in October 1956.





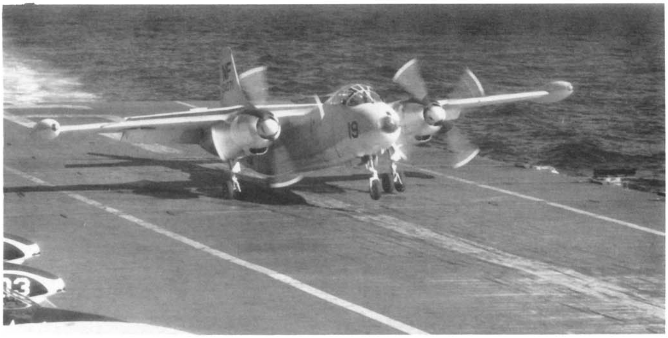


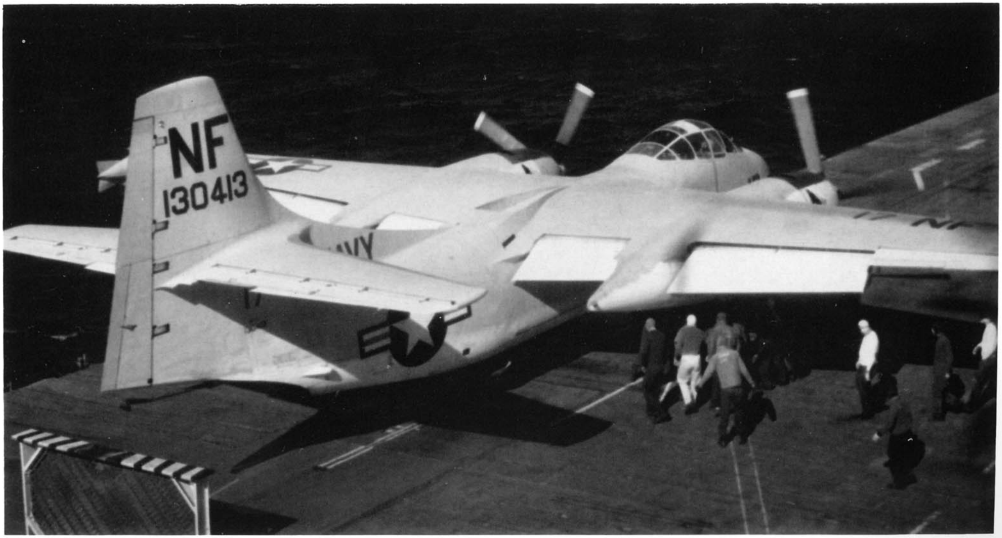
HEAVY SIX

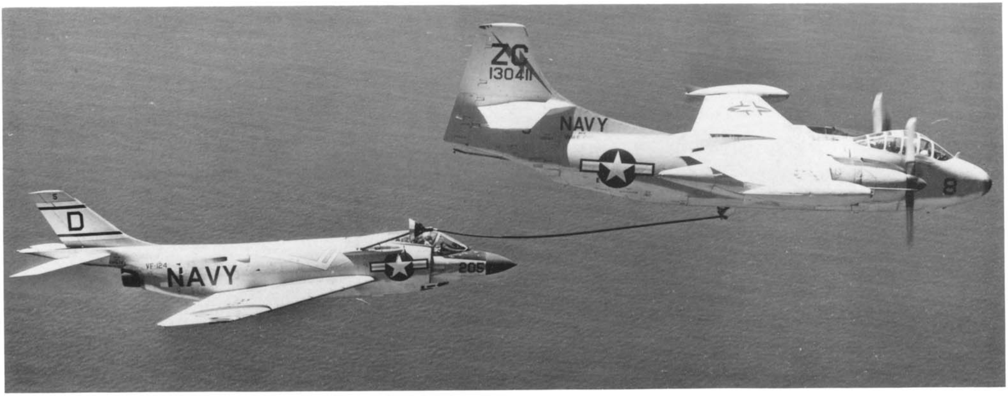
Above, VAH-6 AJ-2 134072 is catapulted off the USS Lexington (CVA-16) on 7-18-56. Tip of nose radome is original Navy blue. (National Archives)

At right, VAH-6 AJ-2 134071 lands aboard the USS Essex (CVA-9) in September 1956. (National Archives)

Below, VAH-6 AJ-2 130413 readies for a catapult launch from the Essex in October 1956. (National Archives)

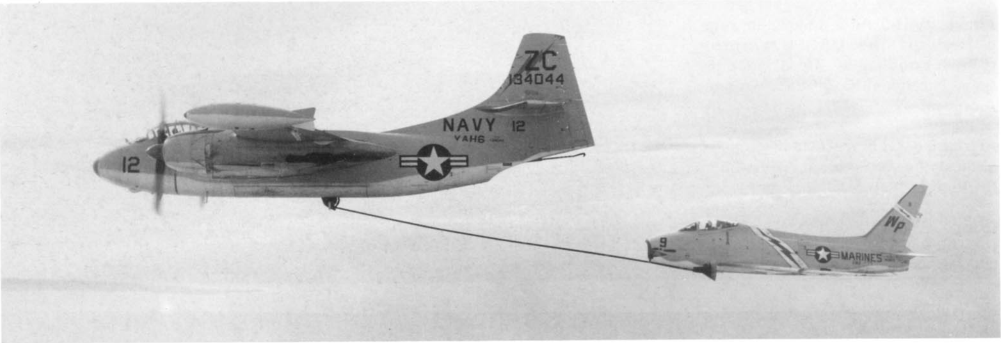




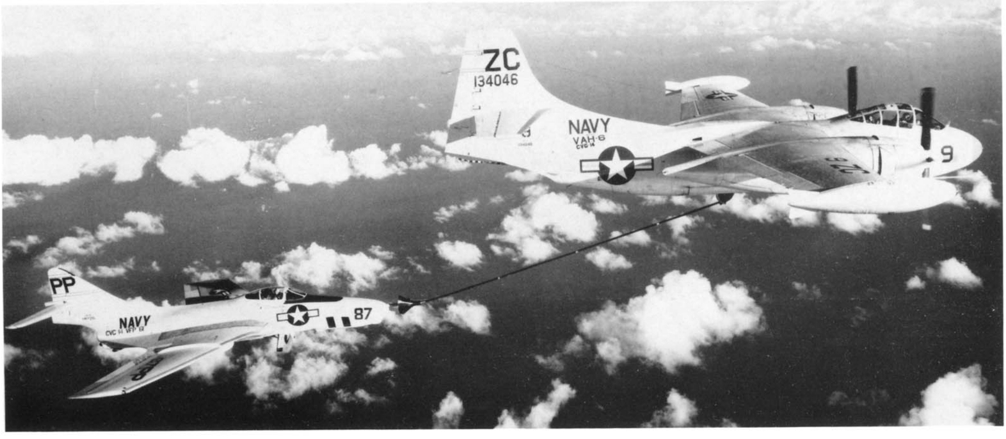


Above, VAH-6 AJ-2 130411 refuels a VF-124 F3H-2N Demon on 9 May 1957. Lightning bolt on the tail and prop spinners were red. (USN)

Below, VAH-6 AJ-2 134044 refuels a VMA-233 FJ-4B Fury off the California coast. (Clay Jansson)



Bottom, VAH-6 AJ-2 134046 from CVG-14 refueling a VFP-61 F9F-8P photo Cougar on 10-3-57.



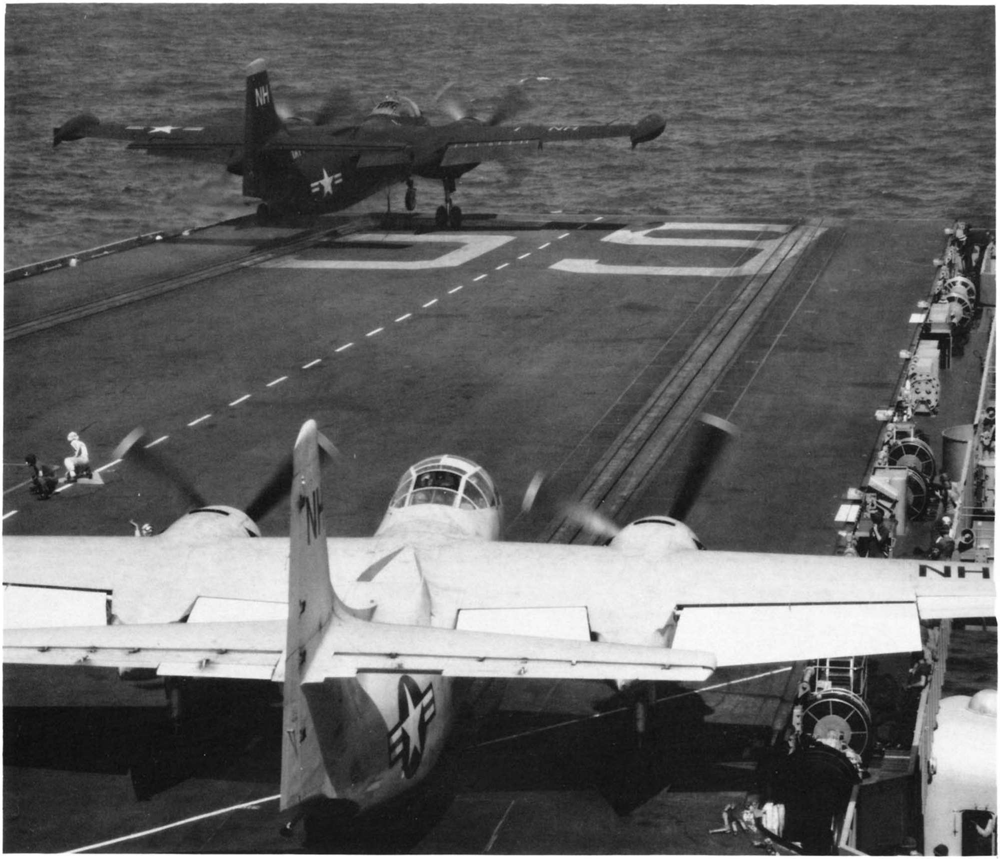
HEAVY ATTACK SQUADRON SEVEN, (VAH-7) "GO-DEVIL'S"

Heavy Seven was formed when VC-7 was redesignated VAH-7 on 1 July 1955. Heavy Seven's Savages were replaced by A3D Skywarriors in 1958. Then in August 1961, VAH-7 became the first Heavy Attack Squadron to convert to the A3J-1 Vigilante. The squadron became RVAH-7 on 1 December 1964 and was disestablished in November 1979.

The squadron's AJ-2 Savages participated in the shakedown cruise of the USS Forrestal (CVA-59) in 1956 and deployed to the Med in 1957. While stationed at NAF Port Lyautey, French Morocco, detachments were provided for the Sixth Fleet. These were: Det 45 aboard CVA-9, Det 36 aboard CVA-15, and Det 34 aboard CVA-39. The squadron participated in Operation Pipeline, the replacement of jet aircraft to the Sixth Fleet, by providing the overwater refueling from 10 May through 17 May 1958.

In 1958, just prior to being replaced by the A3D, VAH-7 won the Atlantic Bombing Derby with a AJ-2 Savage. CDR R. W. Mann whose crew won the derby, tells their story.

LCDR R. W. MANN AND CREW WINS THE 1958 BOMBING DERBY



Both blue and grey VAH-7 AJ-2s operated on CVA-59 during March 1956.

"The Derby was conducted between 2 June and 6 June 1958 and pitted the AJ Savage against the new all-jet A3D Skywarrior. We were the only AJ left in the running by the last day of the Derby, even though the A3Ds were a much more stable platform at 30,000 ft. or better, so it was a miracle that we were still in the running.

"Our last flight was memorable in that we were on our first of 5 runs on the bomb site at Jacksonville, when we lost our compressor, which meant we not only had to go on oxygen, but the cabin heater went out too. We never-the-less continued our runs which took about 2.5 hours and though we were all numb from the freezing temperature, we finished and practically dove to the deck to get warm. Our successful runs were radioed to our squadron VAH-7 ahead of us so the reception on our arrival back at Sanford was quite thrilling.

"My BN (bombardier/navigator) 1st class Petty Officer Valinski, was one of the only enlisted AJ BNs in all of Heavy Attack. My 3rd. CM (third crewman), 1st Class PO Sandifer, was responsible for star shots, handling of the refueling equipment and for setting up the nucs."

FLYING THE AJ SAVAGE
BY CDR. R.W. MANN, USN RET.

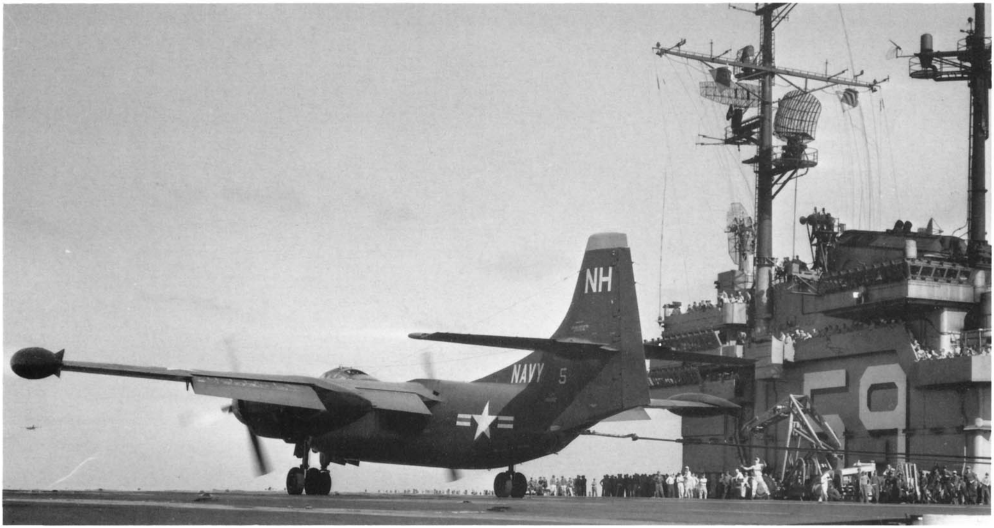
"The plane is flown by only one pilot though the normal crew numbered three (pilot, bombardier-navigator, and third crewman). On some flights, especially cross country RONs, we took a mech also. The aircraft was designed to give the pilot some assistance by making some things automatic, such as the cowl flaps, but this only added to the demand on the pilot as the automatic sensors rarely worked (I always pulled the circuit breaker and operated them myself).

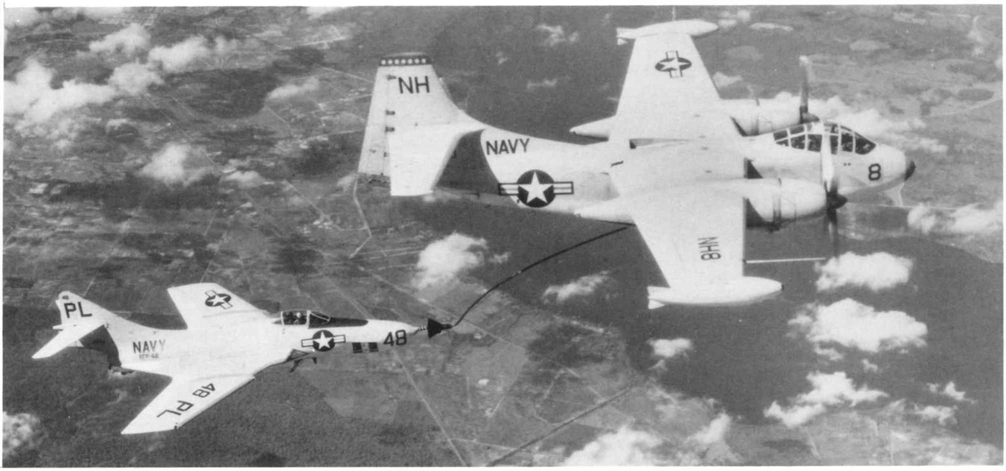
"It was almost impossible to land the plane without the rudder boost (absolutely impossible to land on the CV), so we started the recips (R2800s) port on odd days then checked the boost on that engine, and starboard on even days and checked the boost on that engine, then of course we started the other engine. On land we would taxi out to the end of the runway and start the jet (J33), using electrical power from the recips. This saved a lot of fuel if you were waiting for a clearance, etc. We always used the Jet for TO as it gave you an additional safety factor. Two churning and one burning. If you were climbing for a bomb run immediately, you left the Jet on, if not you would secure the jet as soon as you were cleaned up and the recips looked OK. It was somewhat comforting that if you lost an engine you would go from two to one and fire off the jet and you were back to two again. This happened many times.

"There was no nuc that we could not carry in the late 50s either off land or a CV. We had a tremendous capability of avoiding detection because we went in right on the water or deck using only the recips and then at our predetermined climb point we would fire off the jet and two-block the recips for a max climb to our release altitude (30,000' or better). We were used to transport nucs from carrier to land and vice versa. With some 800 pounds fuel before coming aboard a CV, we didn't care for that op very much as you were either coming aboard or you were going to get wet.

"We carried a lot of fuel for a prop type airplane and consequently had a great range. As I recall we carried

VAH-7 AJ-2 134052 takes the wire during the Forrestal's shakedown cruise in March 1956. Prop spinners and fin tip were red. (National Archives)

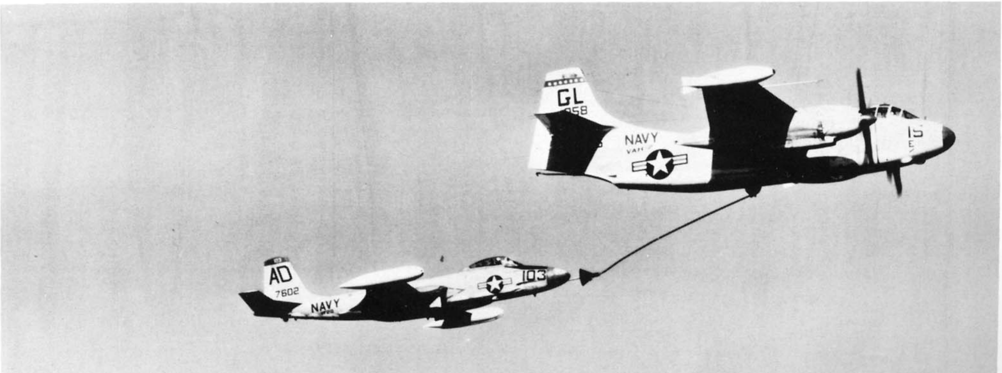




VAH-7 AJ-2 refuels a VFP-62 F9F-8P. Fin tip was red with white stars. Radome nose and prop spinners were red. (USN/Tailhook)

10,200 pounds across the top, that's internal (wings) and tip tanks. If we had the tanker configuration we had another 5400 pounds. I'm not certain of the later figure but it is close. Without the jet burning we could cruise using about 1200 pounds per hour at 200 knots. My longest flight was 7.6 hours. We were used a great deal as the "enemy" in operations in the Med where I had a tour on the Randolph. Because the plane was so large (largest operated aboard a carrier at that time) and because the wings folded manually and consequently were seldom folded on board. We operated as a detachment of five planes with only three on board and two at Port Lyautey, Morocco. All the major maintenance was done at Pt. Lyautey so you can imagine the logistics and personnel problems that surfaced, but we always accomplished our missions because of a gung-ho determination. I flew all the way from the eastern Med to Pt. Lyautey with the nose wheel frozen down because we couldn't put the

VAH-7 AJ-2 refuels 127602, a VF-22 F2H-4, while assigned to the USS Randolph (CVA-15) on 9-6-57. Coveted "E" with hashmark to indicate repeat awards is on the nose. (CDR Mann)



plane on jacks at sea to fix the nose gear which was damaged by a tractor. Many is the time when the weather got bad, and it does in the Med, the announcement would come, 'Hold the Jets, prepare to launch the ADs and AJs', and we would be the only ones to launch, and I mean in any kind of weather. No matter how long we had been airborne we were always the last to be trapped and that is after everyone else is on board no matter how many wave offs or bolters. I've followed planes around the pattern so as to be in position to land if they got aboard, and lo and behold, they would waveoff and I would have to clean up and go around. We were hard to spot when on the deck, so I can understand why we were last, but it was hard to take after an especially long and trying flight.

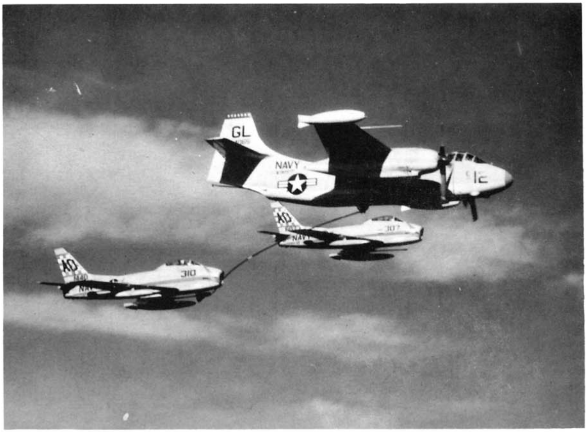
"Changing from a bomber configuration to the tanker configuration was no easy task, especially on board the ship, but our gung-ho maintenance crews accomplished it anyway. Most of the time we would know before an operation, which we would be, tanker, bomber or some other assignment, such as 'enemy' operating off land (usually Naples), so we were ready. If we were the tanker, we would cruise over the force and be ready for any jet that needed a drink. All the jet pilots were checked out by us in the procedure for gulping. Some planes were easier than others because of the lo-

HEAVY SEVEN "GO-DEVIL'S"

Top of the previous page, three VAH-7 AJ-2s in 1957. (CDR Mann) Bottom, VAH-7 AJ-2 130406 on 10-1-57 with the squadron's second official tail code "GL". (via Kaston)

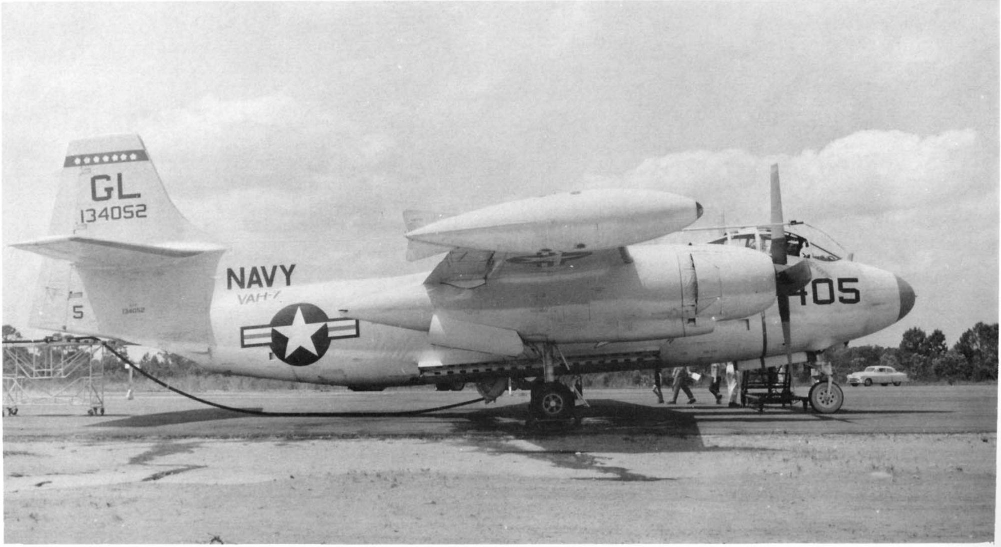
At right, VAH-7 AJ-2 134065 refuels a VF-73 FJ-3M Fury during a fly-by off the USS Randolph in September 1957. (CDR Mann)

Below, VAH-7 AJ-2 134052 on 5-17-58 at NAS Sanford, Florida. The nose, tail stripe, and the prop spinners were red. A yellow rescue arrow has been added above the nose number 405. When the Savage was painted blue, the props were usually black with yellow tips, but on most grey and white AJs they had black gloves followed by dark grey blades with yellow tips. (Swisher)



cation of the probe. Some days were busy and pumped out all our tanker fuel and even some of our own, which we could pump into the tanker even though it was hi-test and pump it out to the jets. On one occasion when I had used up all the tanker fuel and a great deal of my own and was ready to come aboard, I got this frantic call from a Banshee that he was a couple hundred miles out and in a very low state. I was in the traffic pattern but climbed back out and headed toward the Banshee. I met him about 100 miles out and got him hooked up on my drogue. Then I informed him that I could give him only a couple hundred pounds of fuel, but if he would cut one engine gradually and reduce power on his other one, I could "pull" him on a gradual descent to the ship. He was an excellent pilot of which I had first hand knowledge or I would never have attempted what we did. It takes only about 50 pounds pressure to insert the probe into the drogue, but it takes 600 pounds pressure to withdraw it, and if you are real smooth, it will take much more pressure to withdraw. He stayed real calm (eventually he went to the Blue Angels) all the way to the ship, where I gave him all the fuel I could from my own tanks. He fired up his other engine, and got aboard on his first pass. I trapped soon after. I had a hard time buying a drink on the next liberty period in Naples.

"One of the most interesting



VAH-7 DET 45 ON CVA-9

At left, bombing derby winners on 4-4-57. Left to right, Sandifer AM-1, LCDR Mann, Valinski AJ-1. (CDR Mann)

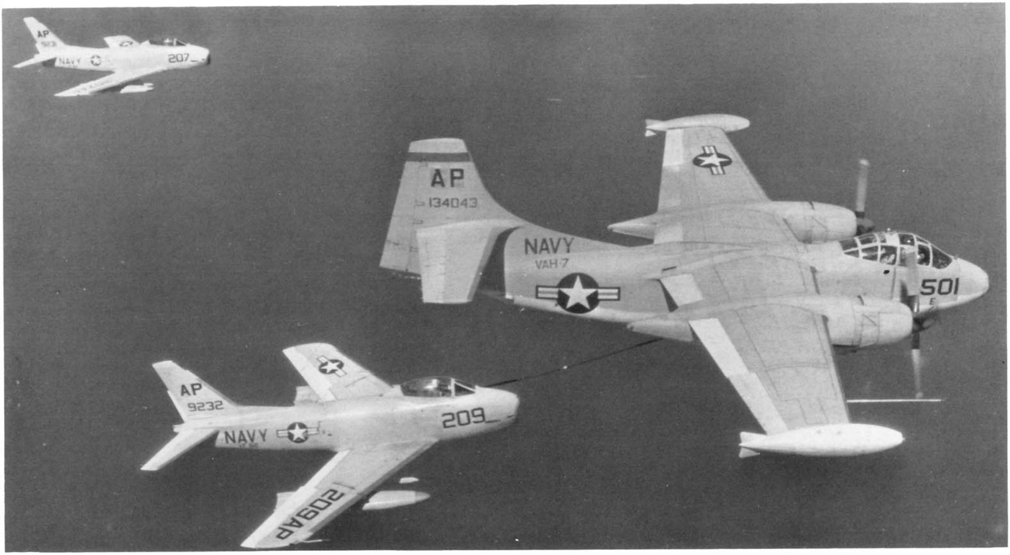
Bottom, VAH-7 AJ-2 134043 refuels VF-62 FJ-3Ms. Aircraft carry the "AP" tail code of Air Task Group 201 (ATG-201). The Savage was assigned to Det 45, which sailed aboard the USS Essex with two sister AJs when CVA-9 left the Med and joined the 7th Fleet during the Formosa Crisis. (USN)

Top photo at right, VAH-7 AJ-2 overflies the deck of the Essex with a broken fuel hose streaming fuel in February 1958. (USN)

Bottom right, same aircraft coming aboard on 5-22-58. (NAA)

emergencies happened to CDR Dan Milner on a night flight in the Med. He was the only plane out and was coming around for landing when he lost one recip. He fired off the jet, but found that he had no rudder boost, which meant that his good engine rudder boost had failed. He was determined to come aboard rather than go to Naples, so he unfeathered his bad engine to windmill it enough to drive his "good" boost and thereby came aboard. To me that was one heroic display of airmanship.

"Because of the size of the AJ it was determined that only the first 3 of 5 wires would be available to be caught on landing, consequently the last 2 wires were flat on the deck. I was the cause of this, because one night I came aboard and held off and caught the fifth wire and ran up the deck and dropped my left landing gear in the catwalk. In the accident report, it was determined that if an AJ was 1/2 of one degree off course at the ramp and caught the No. 5 wire, he would do as I had, therefore No. 4 and No. 5 wires were not used for our landings."



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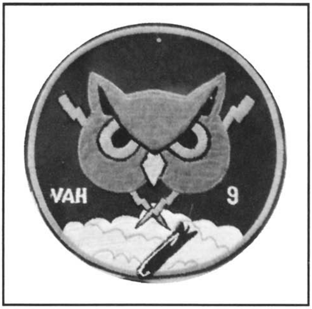
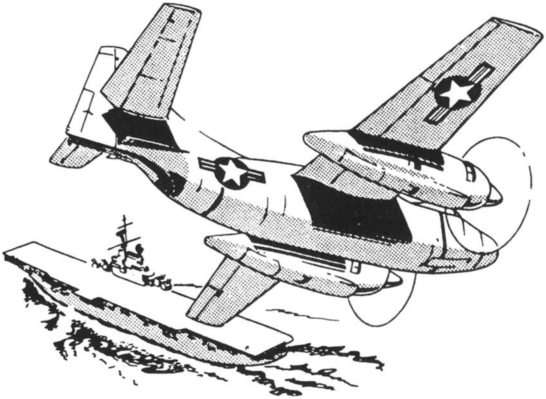
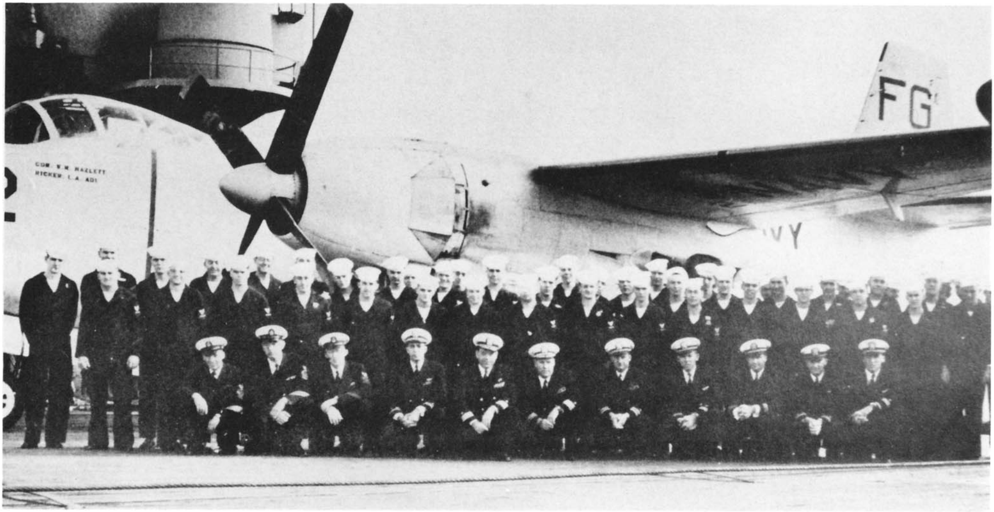
HEAVY ATTACK SQUADRON NINE, (VAH-9) "HOOTERS"



VAH-9 came into being when VC-9 was redesignated VAH-9 in November 1955. Stationed at NAS Sanford, Florida, and still flying Savages, Heavy Nine deployed aboard the USS Ticonderoga (CVA-14) in May 1956. The squadron's first A3D Skywarrior came on strength in January 1957. Heavy Nine conducted five Mediterranean cruises with the A3Ds before transitioning to the RA-5C Vigilante in April 1964. VAH-9 was redesignated RVAH-9 on 3 June and as such would conduct nine cruises with the "Vigis" before being disestablished on 30 September 1977.

The squadron's "FG" tail code changed to "GM" in 1957, but since Heavy Nine's AJs were phased out in January, it is doubtful any of the squadron's Savages carried the "GM" code.





VAH-9 detachment in front of a grey and white AJ-2 assigned to the "Tico" in May 1956. Prop spinners were red.

HEAVY ATTACK SQUADRON ELEVEN, (VAH-11)

VAH-11 came into being when Composite Squadron Eight (VC-8) was redesignated VAH-11 on 1 November 1955. Stationed at NAS Sanford, Florida, VAH-11 flew a complement of twelve AJ-1 Savages.

In anticipation of the arrival of the Douglas A3D Skywarrior, the Heavy Attack Wing was reorganized and the Composite Squadrons were redesignated Heavy Attack Squadrons with all odd numbered squadrons being stationed on the East Coast and all even numbered squadrons stationed on the West Coast. Therefore VC-8 was redesignated VAH-11 as this was the next odd number available after VAH-9.

In October 1956 VAH-11 deployed to the Med for the first time since its redesignation.

From 1 July until 8 July 1957, VAH-11 conducted inflight refueling tests at Chance Vought Aircraft in Dallas, Texas, to determine if the inflight refueling system of the F8U Crusader was satisfactory. With the tests completed, VAH-11 provided the inflight East Coast refueling services for MAJ John Glenn's record-breaking Operation Bullet flight of 7 July 1957.

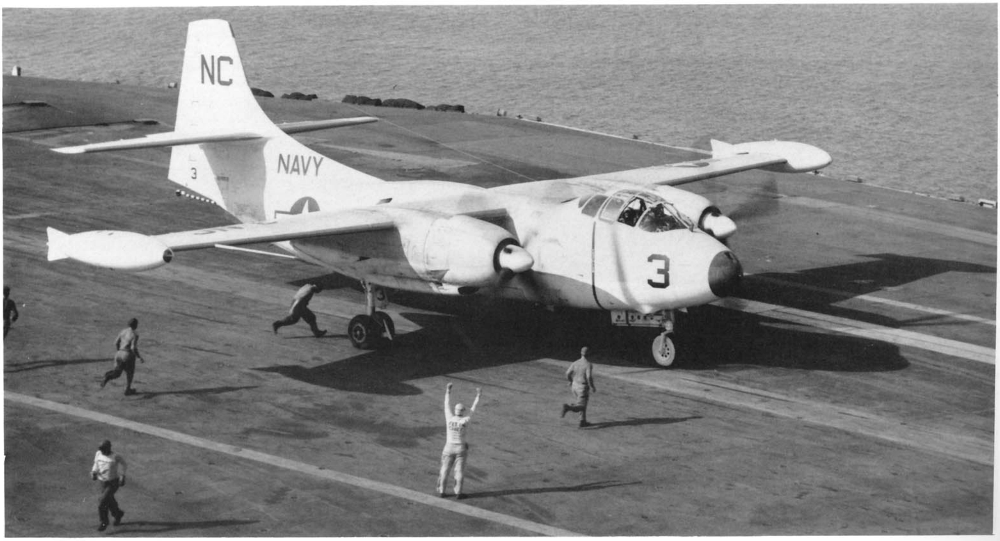
The squadron's last deployment of the Savage came on 3 through 30 September 1957 when Det 45 was assigned to the USS Essex (CVA-9). The squadron then provided refueling services for Operation Sea Spray from 30 September until 10 October and Operation Strike Back (NATO exercise).

Before receiving Skywarriors in November 1957, the squadron's AJ-1s won the Conover Trophy as the HATWING One Third Quarter Bombing Derby High Altitude Champs. The RA-5C Vigilante replaced the A3D-2s in July 1966 and the squadron was redesignated RVAH-11. RVAH-11 was disestablished on 1 June 1975.

CAPT ROBERT L. METZGER, USN (RET) RECALLS VAH-11

"In addition to the Project Bullet flight, our squadron refueled CAPT Dose and his wingman during their historic carrier-to-carrier cross-country flight. The VX-3 Crusaders launched from the USS Shangri-La off San Diego and landed on the USS Saratoga with President Eisenhower embarked off Jacksonville. Flight time as I recall was 3 hours and 23 minutes. I refueled him over Love Field, Dallas, and therein lies the story. When Dose

VAH-11 AJ-1 124853 taxis after landing on the USS Saratoga (CVA-60) in August 1956. VAH-11 operated the retrofitted AJ-1s almost exclusively. The only AJ-2s operated were 130406, 407, and 421. (USN)



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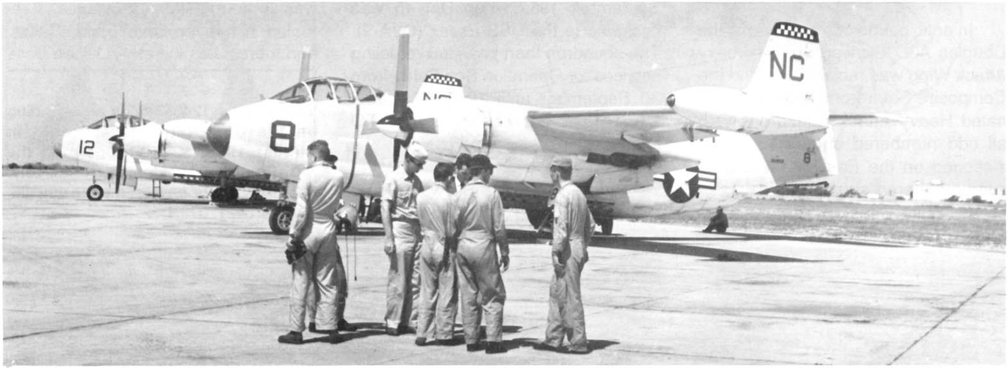
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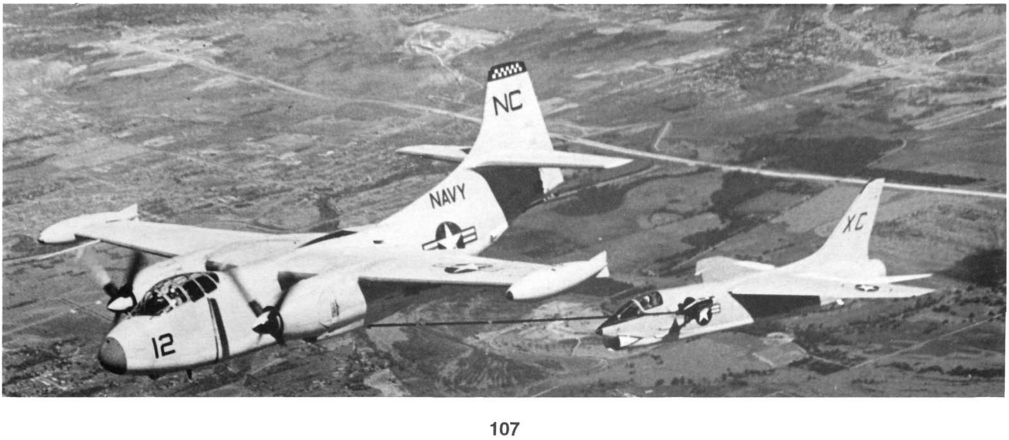
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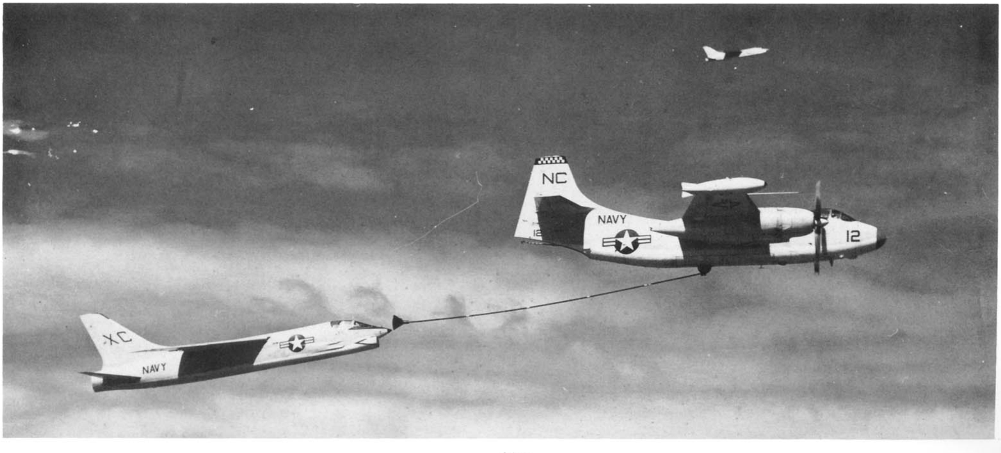
At left, top, two VAH-11 crews in front of a squadron AJ-1 with black and white prop spinners. Middle, the two VAH-11 crews and aircraft prior to taking off and tanking CAPT Dose and his wingman on their coast-to-coast record flight on 6-6-57. Bottom, Bob Metzger refuels CAPT Bob Dose on 6-6-57. The fin tips were black and white checkerboard. (via CAPT Metzger)

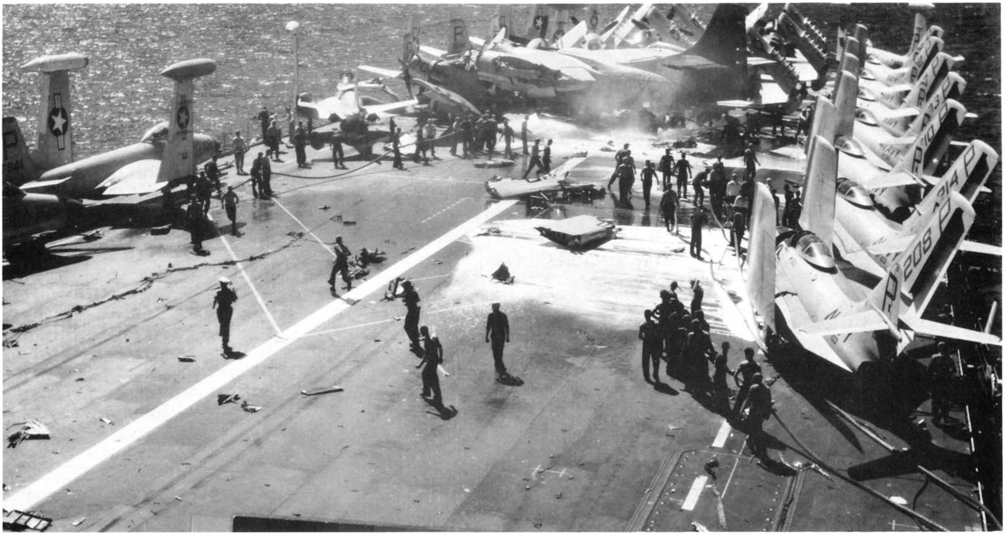
approached Texas from San Diego, he was at maximum altitude, which I recall was about 50,000 feet. I was circling Love Field at about 26,000 feet with two turning and one burning, and with a full tanker package in the bomb bay. Because of his contrails, I was able to see him visually when he reported beginning his descent to rendezvous with me. As he descended, I turned east to give him the best advantage on distance to the Saratoga. Obviously, with my tail turned toward him I no longer could see him. Therefore, I had my third crewman, AT3 Fields, get out of his seat and watch the approach. At this point in time CAPT Dose and his wingman both stated they did not have me in sight, but gave their position relative to Love Field and their altitude. Fields at this point reported that he did not see them either. Seconds passed and, believe me, we were sweating for if they didn't get fuel or if they had to circle once or twice, precious minutes would be lost. At the last second, Fields told me on the intercom, 'I have them in sight!'. 'Give them steers on UHF, Fields,' I replied. And that is how the F8Us found us - - - a third class petty officer 'saved the day'. Fields vectored them in to me. They plugged in, gulped fuel, withdrew, and went back on afterburner to altitude and on to Saratoga. The date of this flight was 6 June 1957, the 12th anniversary of my graduation from the Naval Academy.

"As you know, one of the most important missions which the AJ fulfilled was as a tanker for the F9F-8s on the Sixth Fleet carriers. These short-legged fighters were a constant problem due to their low endurance. Thus, a tanker was launched with every flight and was available to the recovering flight in the event of a low fuel state bird returning. Well, to make a long story short, my ensign roommate on the Coral Sea gave a lecture in the morning meeting on the two ways to release the tanker package and drop it from the bomb bay in the event of an emergency. He also covered the safety procedures which would prevent such an occurrence. One hour after giving the lecture, he manned his aircraft as the bombardier/navigator, prepared for launch, and, you guessed it, pulled the wrong lever and dropped the tanker package on the deck. The aircraft was spotted smack dab in the recovery area, the package split open, fuel spilled over the deck, and aircraft were now returning for recovery. To further shorten this story, the flight deck crews of VAH-11 and Coral Sea never worked faster. The AJ was jacked up so the tanker package could be withdrawn, the deck flooded with water to flush the fuel, and everyone just literally held their breath hoping nothing caught on fire and that the recovering aircraft could hold out overhead until we cleaned up the mess. We made it! But talk about one embarrassed ensign.

"The last deployment of VAH-11 in AJ aircraft was an opportunity to make some unauthorized modifications to these aircraft. We had an operations officer named CDR John J. Emanski, who was an electronics engineer and had a lot of experience in the Savage. John came up with modifications to the aircraft that would have taken the Naval Air Systems Command five years to implement. We rewired and re-antennaed our altimeter, our YE/YG beacon receiver, installed special turbo lines to allow us to transfer wing tip fuel without being at altitude or going to 40 inches of manifold pressure, wing tip fuel tank gauges, etc. Our aircraft looked like the proverbial "man from Mars" with their new antennae sprouting out of the nacelles. But everything worked like new!

Below, CAPT Dose refuels from Bob Metzger while his wingman waits above. (via Robert Metezger)





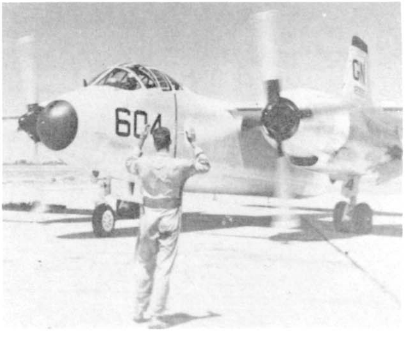
VAH-11 replaced VAH-5 abaord the Coral Sea just after the above crash took place. This Savage came aboard without flaps. (via Robert Metzger)

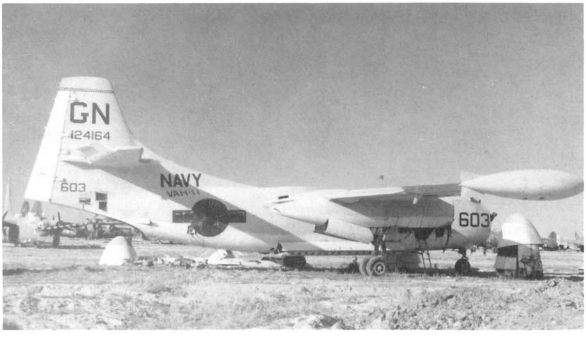
OPERATION BULLET REFUELING

At left, VAH-11 crews brief for John Glenn's record-breaking Operation Bullet Flight of 7 July 1957. (Vought)

Below left, Operation Bullet AJ taxis out to launch for the refueling mission of John Glenn's flight. At this point VAH-11 Savages have the squadron's new "GN" code on the tail. (Vought)

Below right, VAH-11 AJ-1 124164 at NAF Litchfield Park on 3-21-60. A row of small black "X"s were painted between the fin cap and the rudder. (Swisher)

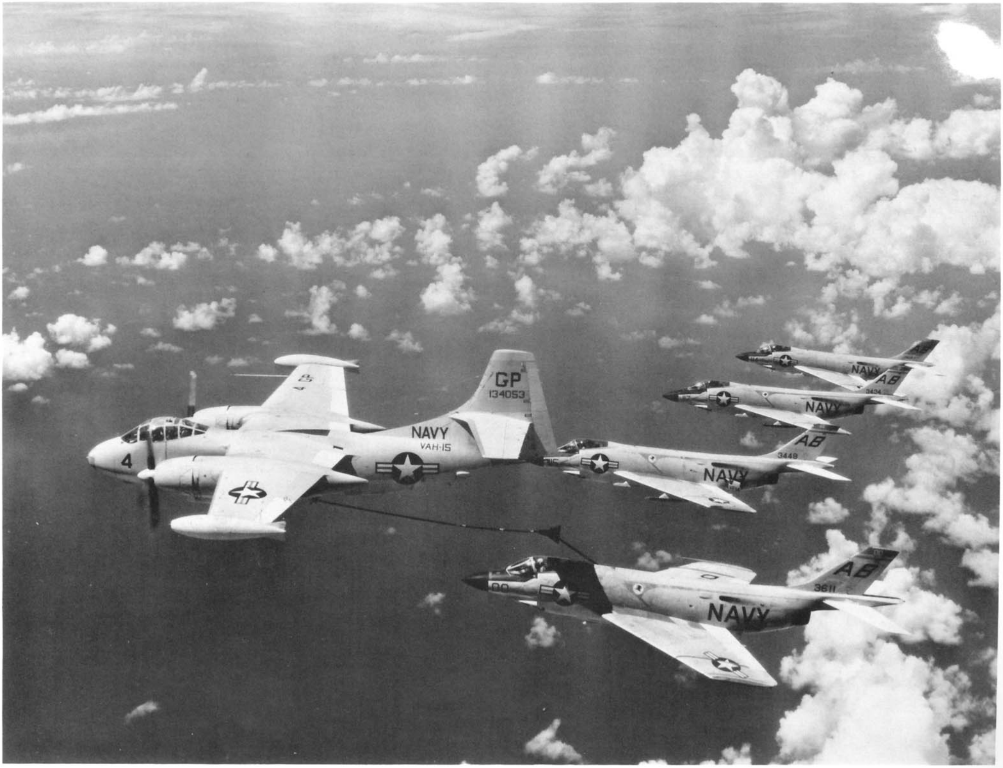




HEAVY ATTACK SQUADRON FIFTEEN, (VAH-15)

Heavy Fifteen was established at NAS Norfolk, Virginia, in January 1958 flying the AJ-2 Savage (BuNo's 130406,416, 134035, 037, 039, 051, 052, 053, 063, 065, 067, and 069). VAH-15 was established to provide inflight refueling for the Atlantic Fleet and provided this service for only thirteen months until the squadron was disestablished in February 1959.

VAH-15 AJ-2 134053 refuels VF-14 F3H-2M Demons from the USS Franklin D. Roosevelt (CVA-42) in 1958. Fin tip and prop spinners were white and jet intake door was open as the J33 was operated during tanking. (USN)

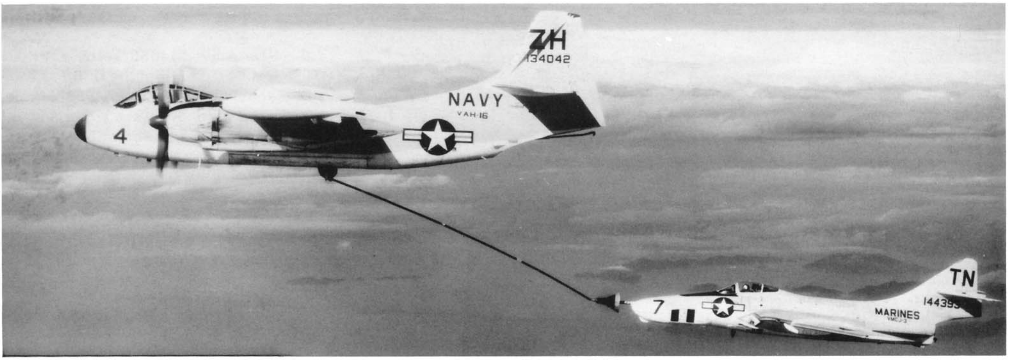


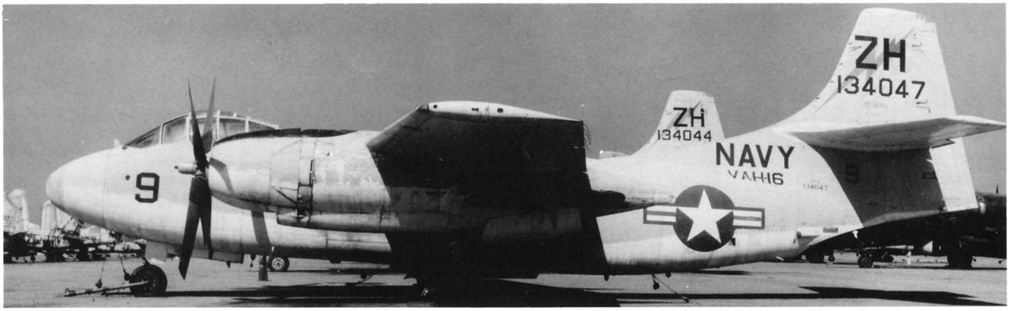
HEAVY ATTACK SQUADRON SIXTEEN, (VAH-16)

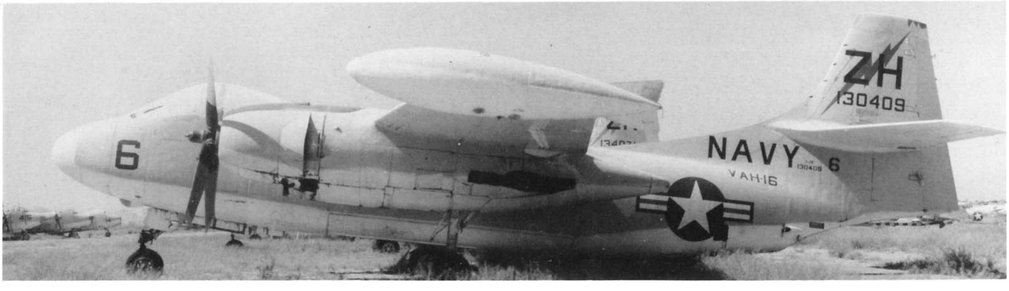
VAH-16

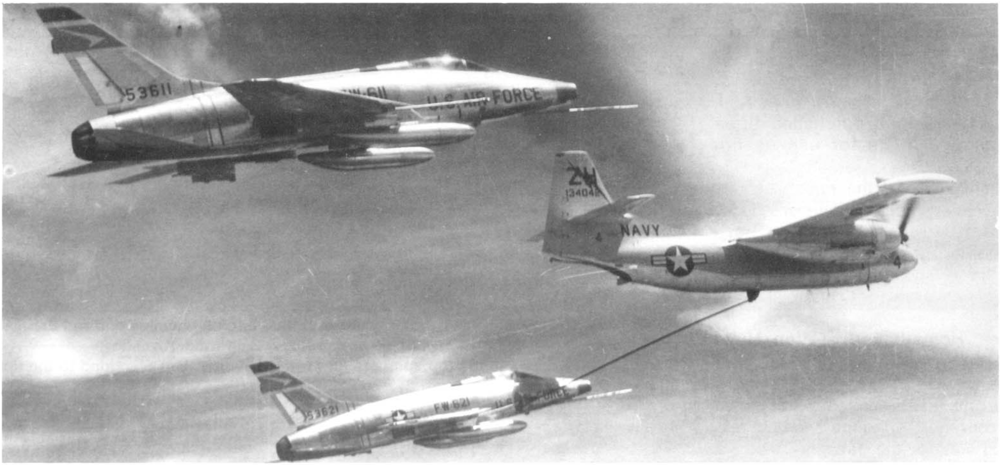
VAH-16, like VAH-15, provided in-flight refueling and was in operation from January 1958 until February 1959. Based at North Island, California, VAH-16's AJ-2s serviced the Pacific Fleet.

Top, VAH-16 AJ-2 134042 refuels VMCJ-3 F9F-8P 144393 over the Sea of Japan. (Jansson) Middle, AJ-2 134047 at NAS Alameda on 8-20-60. (D. Olson via Swisher) Bottom, AJ-2 130409 at NAF Litchfield Park on 3-21-60. (Swisher)

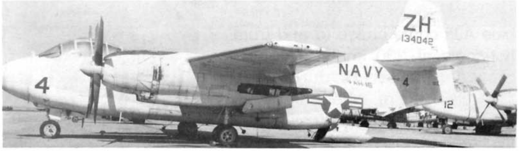


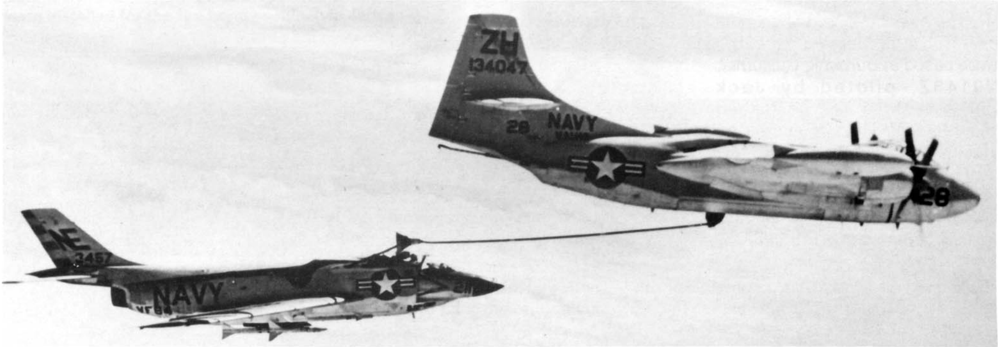


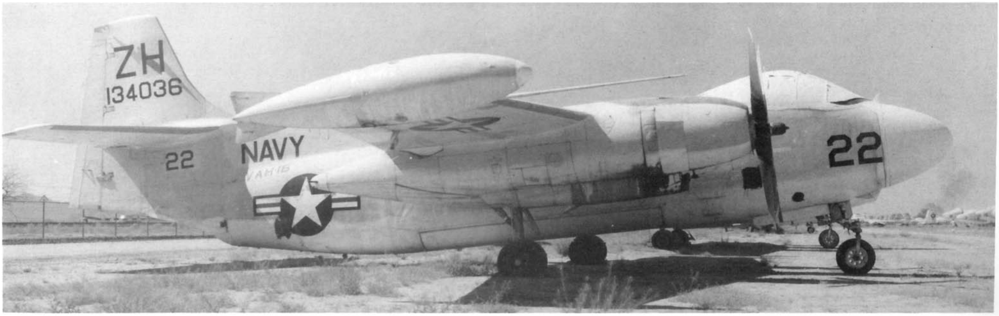




Above, VAH-16 AJ-2 134042 refuels two USAF F-100 Super Sabres. (via Bob Lawson) At right, VAH-16 AJ-2 134042 sans tip tanks. (Leo Kohn) Below, VAH-16 AJ-2 134047 tanking a VF-64 F3H-2M Demon armed with Sparrows and Sidewinders over the Pacific. (USN) Bottom, VAH-16 AJ-2 134036 at NAF Litchfield Park on 3-21-60. The lightning bolt on the tail and the prop spinners were green. (Swisher)



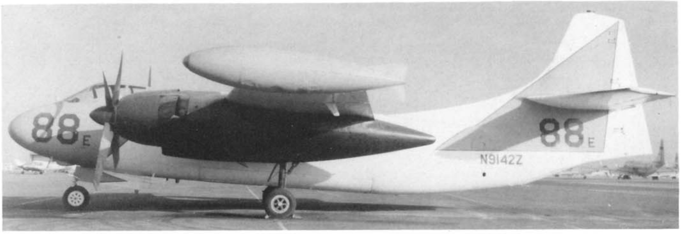




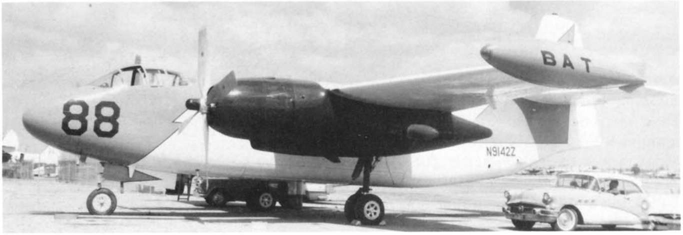
In early 1960, the J. M. Jackson Co., later known as A. J. Tankers Inc., purchased three surplus AJ-1s for use as fire bombers. The jet engines was removed and the radial engines were overhauled in preparation for the ferry flight to Southern California. During the flight one of the Savages was lost and only two were available to fight forest fires.

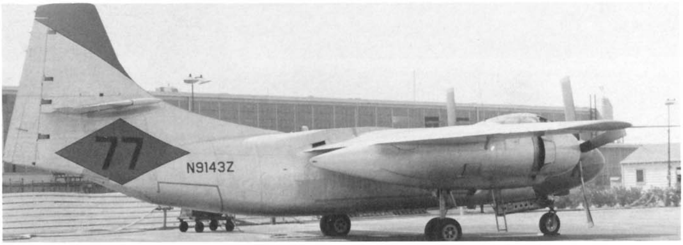
Home-based at Van Nuys Airport, AJ-1s 124158 (N9142Z) and 124167 (N9143Z) were completely overhauled and converted to the fire bombing role in time for the 1961 fire season. With a full load of 2,000 gallons of retardant, the distinctive red-white-blue AJs could cruise to and from hot-spots at 230 knots. The AJs proved themselves during the 1961 Bel Air Fire, where they held the fire at bay along a 20 mile front until ground units could control it.

The AJs continued to fight fires until 1967. In September 1967, while based at Burbank, California, N9143Z, piloted by Jack Henessey, was lost on takeoff when an engine quit. After the fatal crash N9142Z flew only a few more times until becoming unserviceable. The engines were finally removed and the aircraft was cut up for scrap in 1968/69.

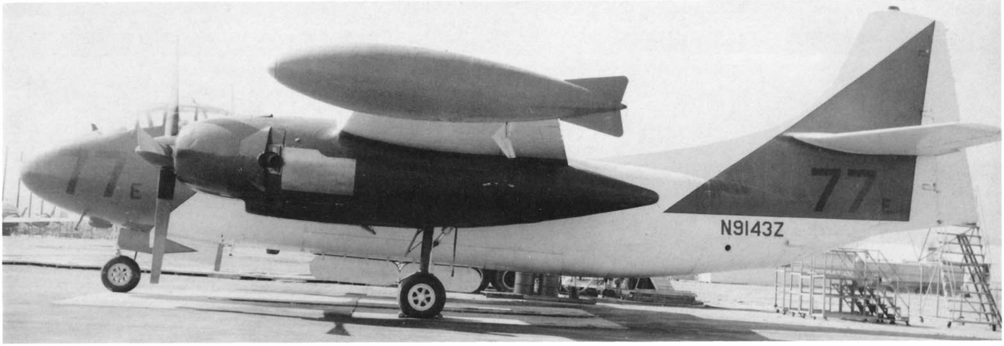


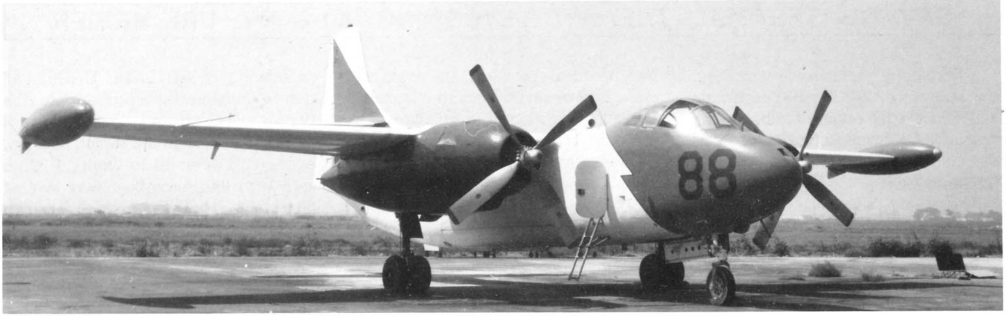
Above, AJ-1 N9142Z (88E) is painted white with blue engine nacelles and red-orange nose, tail flash and tip tanks on 12-8-62 at Van Nuys, California. (Swisher)
Below, N9142Z again sans prop spinners and with the word "BATS" added to the tip tanks. (Leo Kohn)



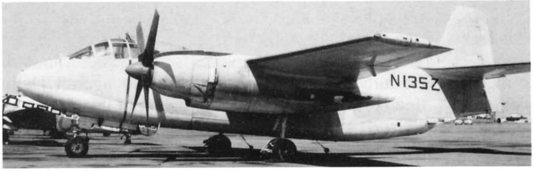


Above right, AJ-1 N9143Z in natural metal with red nose and tail flashes. (via Burger)
Below, N9143Z, tanker 77E repainted in the white-blue-red-orange color scheme. (Art Krieger via Menard)



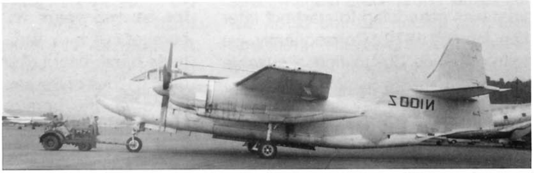


FIRE BOMBER

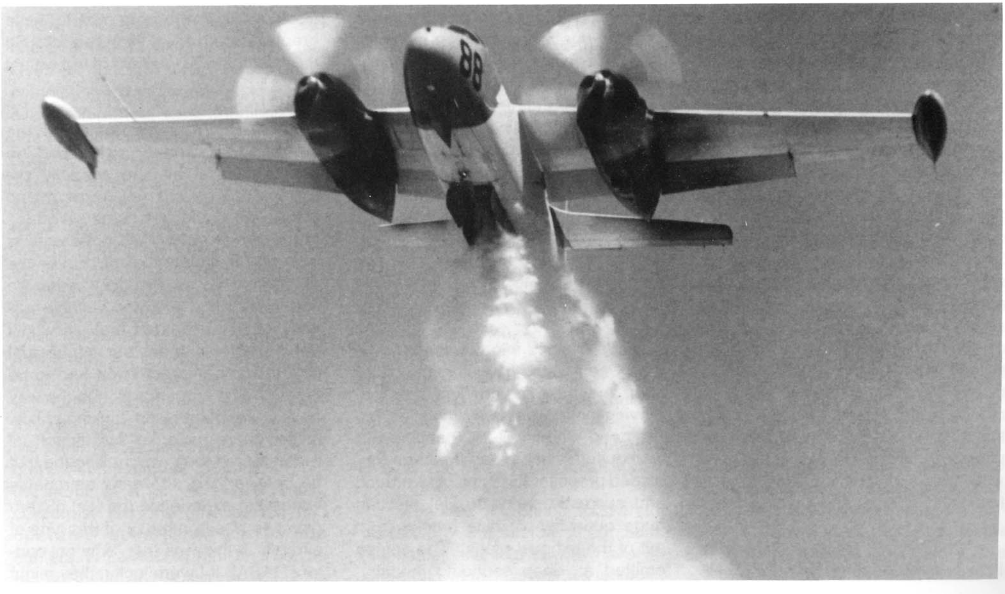


Top, N9143Z (88) on the ramp with crew door open and crew ladder in place. (via Nicolau)

At right, two AJ-2s were bought for firefighting in Washington, but never used. N135Z at Alameda on 8-21-60. (Larkins) N100Z at Boeing Field, Washington, on 5-26-62. (via Smalley)



Below, N9142Z (88) on a test drop. New bomb doors were installed for the fire bomber role. (via Jansson)



SAVAGE TESTBED, THE AVCO-LYCOMING AJ-2 BY URI BREIER

"For many years Avco-Lycoming had operated AJ-2 N68667, formerly N101Z, as a jet engine testbed. This particular AJ-2 was BuNo 130418 and was operated by the Navy between 1953 and 1959.

"The saga of the Lycoming AJ-2 goes as far back as late 1969. At that time, the Air Force awarded contracts to Fairchild and Northrop for the development of an attack and observation plane. Northrop selected Lycoming to power their A-9A aircraft. Our task was to use the core of our T-55 Helicopter Tuboshaft engine and to modify it to a turbofan engine providing the power for this aircraft. Northrop required and Lycoming agreed to subject this engine to a rigorous flight test program. According to that agreement, the flight test program was scheduled to start not later than January 1972. Consequently, we had no choice but to find a suitable test aircraft.

"We started to investigate which World War II aircraft would be most suitable for our purposes and most cost effective. The consensus of all concerned was that a B-26 would be just the right aircraft. Many aircraft of this type were available and rather inexpensive. We selected a beautiful B-26 and already contacted aircraft modification companies to make preliminary installation studies when the operating requirements for the A-9A were raised. It was to reach an altitude up to 30,000 feet and fly a maximum speed of up to 0.8 Mach. Since the B-26 was not able to reach either such altitude nor speed, another aircraft had to be found. To find an aircraft capable to meet the new requirements was certainly not an easy task. All dealers we had earlier contacted were appraised of the new requirements and everybody stated that it would be very difficult if not impossible to find such an aircraft. A few weeks passed, nothing suitable was found.

"On Jan. 7, 1970, a salesman from Tucson, Arizona, called me. He had heard of our need for a test aircraft, and believed he had a suitable aircraft. The aircraft in question was an AJ-2. This aircraft could be seen in Madras, Oregon. It would be available for relatively low cost and would most probably satisfy our requirements. None of us had ever heard of an AJ-2, so we consulted "Janes All The World Aircraft". According to the description therein the Savage could suit our needs. After we received some pictures of the aircraft and additional information, we decided to further investigate its suitability. It was decided that I should fly to Madras, Oregon, to see the aircraft firsthand. I met the owner of the aircraft, at the municipal airport, and he took me to his private airport, located behind his home.

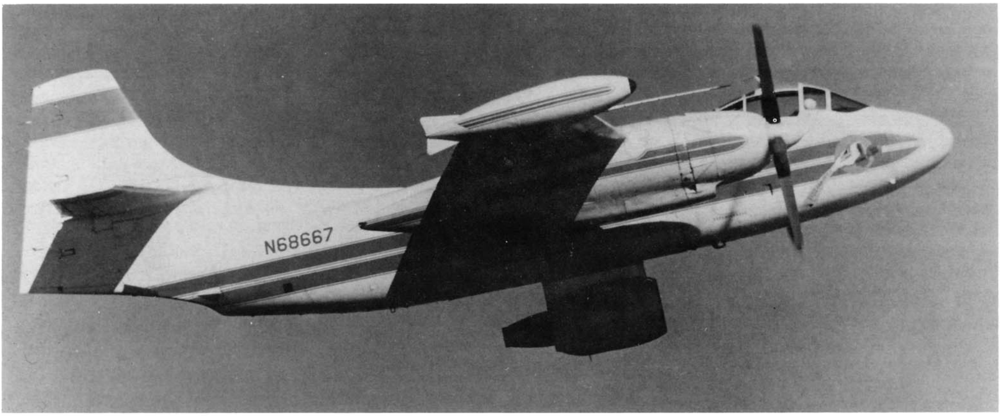
"The owner had used this aircraft for several years as a fire fighting bomber. A tank was installed in the huge bomb bay, holding several hundred gallons of Borate. Once over the fire area, the borate was released, choking the fire. The state of Oregon had taken over the fire fighting functions with helicopter, so this aircraft was no longer needed. It had been grounded for the last two years, but run-ups were made periodically and the engines were in good shape.

"The third engine, an Allison J-33 jet, normally installed in the tail of this aircraft, was missing. The owner said that there were plenty of such engines around and that we could easily get one installed. The bomb bay of this aircraft was really huge. Cursory measurements indicated that we should be able to fit our engine into this bay.

"We climbed into the cockpit, and the owner seated himself in the pilot's seat and I sat in the right seat observing how he was starting the big Pratt and Whitney R-2800 engines. It was quite a sight to see the huge four bladed propeller turning slowly around and suddenly spring to life, ejecting huge quantities of blue smoke from out of the exhaust pipes. The engine emitted a deep sounding, healthy, reassuring BRRB BRRB BRRP. All gages registered the proper data, the flaps moved up and down, the cowl flaps responded to the switch settings, everything seemed to work. I fell in love with this aircraft; it was love at first sight. However, my enthusiasm was reduced a bit following a more thorough inspection. Removing some of its inspection plates , I discovered that the aircraft had really been neglected. Dust and sand was everywhere and the electric cables seemed to have dried out. I was afraid we would encounter many problems. Would we ever be able to get this aircraft to become a reliable, safe flight test bed? After all, I was supposed to fly this aircraft. I pushed such thoughts out of my mind. No other aircraft was available, so far. This AJ-2 would and must be the one.

"I looked over the military performance manuals. According to information contained therein, the aircraft would, at least theoretically, be able to reach 30,000 feet and with the two R-2800 engines at full power and with the jet at 100% we should be able to reach the required 0.8 Mach. The trouble was that a note next to these graphs stated, " Not flight tested". So the question was--will we or will we not make it?

"I asked the owner about the spare parts situation. He had no spare parts at all and candidly admitted that he did not know if and where we could get some. Without parts we certainly could not dream to purchase this aircraft at all. But on the other hand, it was doubtful whether we could ever find another suitable aircraft and I was afraid that we would not be able to meet our contractual obligation. So every effort had to be made to find spare parts. On the way back to the plant I was thinking of how to get spare parts for this aircraft. I remembered the owner telling me that he believed that the early astronauts learned to experience the feel of zero gravity in the bomb bay of this type of aircraft. If this was true, why not contact NASA? If I were lucky, they might



still have the aircraft which, when no longer flyable or used, could be utilized for spare parts.

"Back at the plant I reported my findings of this aircraft to Bob Schaefer, Director of Engineering. The cost of the aircraft, $45,000 delivered at Stratford, fully licensed, including the installed jet engine, was certainly a deal.

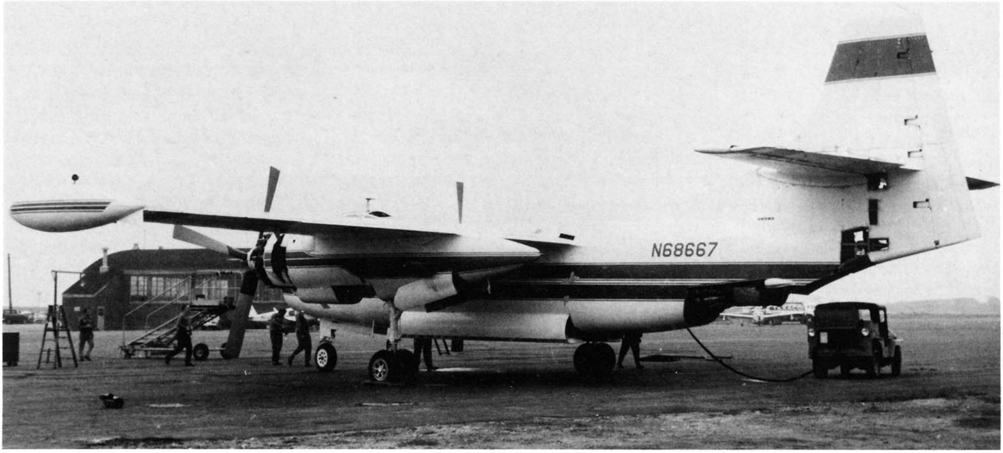
"I started looking for parts, and several phone calls later I learned that NASA, in Cleveland, Ohio, really did use three AJ-2s for zero gravity exercises for the first astronauts. Since completing these exercises, the three aircraft, in perfect flying condition, had been turned over to the airport fire brigade for fire fighting exercises. All three aircraft were burnt. Nevertheless, I decided to fly to Cleveland to meet the pilots who flew the AJ-2, hoping to learn something about its flying characteristics and about its maintainability. The general consensus was that the AJ-2 was a good flying machine, but very heavy on the maintenance.

"Unfortunately, no one could help me with respect to spare parts. All of the parts NASA had owned had been burnt with the aircraft. Somehow, I got the name of a Mr. Folz in Burbank, California. At one time he too had operated several AJ-2's as fire fighters. I contacted him and no, he did not have any spare parts, but he had several boxes of original microfiches and manuals of the entire aircraft, In order to modify the aircraft to our needs, we certainly would need these manuals and microfiches. I did not think too much and ordered all of his stuff for several hundred dollars! A few days later, several boxes arrived with all of that material. 295 pounds of manuals and microfiches. Mr. Folz also gave us some contacts who might still have some AJ-2 parts. I started to phone from one possible source to another. Everyone thought someone else might have parts until I finally got the name of a scrap dealer in Cleveland, Ohio. The dealer did not know what he actually had. All he knew was that he had stored many large aircraft parts. I immediately asked Hobby Hobson, at that time our Chief of Maintenance, to proceed to Cleveland, and to investigate. Hobby called back. Jubilantly, he confirmed that there were lots of AJ-2 parts. He thought we would have enough parts for several years of flying. I persuaded my supervisor to immediately approve the purchase of these parts, even before buying the aircraft. Three truckloads brought the stuff to Lycoming, Stratford. We had quite a problem accommodating all of the material. I do not remember the cost of all of that, but it was a small sum.

"Now we could concentrate on the purchase of the aircraft. I contacted the dealer and told him to have the aircraft flown to Tucson; we would inspect it again and if found satisfactory we would buy the aircraft right there and then. This arrangement was actually made to assure us that the aircraft was in flying condition. The dealer agreed. The aircraft would be flown to Tucson within two weeks. The dealer promised that the aircraft would be licensed and ready for delivery within two months.

Red and white Avco-Lycoming AJ-2 in flight with the F102 turbofan extended. (Avco via Bob Lawson)

"That meant that if everything would go according to plan, we would get the aircraft to Stratford by May/June 1970, in ample time to make our modification. Two weeks passed and the aircraft was still not delivered to Tucson. I contacted the owner and he and his son had taken off as planned but within 15 minutes of flying, one of the R-2800 engines caught fire and they had to return back home. That was the first unscheduled delay. Finally, several weeks later, they managed to fly the aircraft to Tucson. Since I did not want to be the only one to make such an important decision to purchase or not to purchase this aircraft, I asked Rudy Opitz, one of our test pilots and Wess Cormac, from our purchasing department, to fly to Tucson. Rudy would give the aircraft a final inspection and if satisfied Wess Cormac would pay for the aircraft right there and then with a $45,000 check. Rudy liked the aircraft



N68667 undergoing heavy maintenance at Bridgeport, Conn, on 9-17-71. (AAHS)

and Wess paid for it and thus the aircraft was ours and the dealer could start to get the AJ-2 into shape.

"Meanwhile, Bill O'Connor, manager of the Lycoming design department, started to make layout drawings with the help of the microfiches. It was clear that the instrumentation recording equipment would have to be installed in the cockpit. The big question was obviously where and how to install the F-102 fan engine. Bill O'Connor came up with two possibilities, to either mount this engine in front of the nose of the aircraft or to install it in the bomb bay installation. Each of these possibilities had advantages and drawbacks. Most of us were in favor of the bomb bay installation. Engineers from North American were consulted and since they too opted for the bomb bay installation, it was decided to go that way. Bill was working full speed trying to find out how to fit the F-102 engine into the bomb bay. The idea was to have the engine retracted as far as possible into the bomb bay as long as the aircraft was on the ground. At that stage the bomb bay doors would remain open. Once airborne and ready for the test, the engine would be extended, and the bomb bay doors would be closed. The up and down travel of this engine would be accomplished with a hydraulically operated deployment system entirely independent from the aircraft hydraulic system. In addition, a back-up system in the form of an electric winch was considered to only raise the engine before landing should the hydraulic system fail.

"Once the basic concept for the F-102 engine installation was perceived, we had to decide how to, at first, install the deployment system, of considerable dimensions, into the bomb bay and then, how to mount the F-102 onto this rig. We also knew it was necessary to occasionally run up the F-102 on the ground to calibrate its instrumentation and to perform engine checks before a flight while mounted onto the aircraft.

"The problem was solved with the use of three table lifts, one table for each aircraft wheel assembly. The aircraft would simply be rolled over the tables and electro-hydraulic pumps would raise the tables and lift the aircraft about six feet off the ground. These tables could be used in the hangar as well as outside, thus permitting us to install the deployment mechanism and engine as well as making our ground runs with the F-102 engine. We also had many meetings with the instrumentation department; Ed Twarog and Jim Damato worked very hard to write specification for a suitable cockpit installed instrumentation system capable of accumulating all of the data Engineering required.

"Meanwhile, the people in Tucson were supposed to continue their work preparing the aircraft for the flight to Stratford. However, I was not very happy with the AJ-2 work progress reports I received from Tucson. In October 1970, we decided to send Hobby Hobson, the Chief Mechanic of our Flight Test Department, to Tucson. Hobby was supposed to supervise the workmanship and expedite the work process. A week or two after his arrival, he requested that I come down to see what I could do to speed up the operation. The problem was really a simple one: the Chief Mechanic was actually a very capable and knowledgeable man, he just could not organize the available manpower. The result of my visit was that the owner of that outfit as well as the Chief Mechanic agreed Hobby would be in charge of the men and do the work assignments. Although the work progressed faster it did not go fast enough because we had to deal basically with untrained help.

"Three months later the end was still not in sight. Electrical problems appeared everywhere. To overcome these we decided to send Alwa Wilder, our at-that-time very able Aircraft Electrician, to Tucson. We decided to send also to Tucson, Swen "Sweet" Lundgreen, a very able and resourceful Aircraft Mechanic. Sweet's particular strength was his inventiveness. He would never drop a problem until a solution was found. Meanwhile, I made arrangements for my check-out on this aircraft which I had never flown before. The original owner was willing to check me out. Since the aircraft had only one set of controls, he would be at the controls while I would observe from the co-pilot's seat the aircraft's attitude during take-off and landings. After several such flights I would fly the aircraft from the left seat while he watched me. Once checked out, I would fly the aircraft back to Stratford with Butch Davis as co-pilot and Hobby as Flight Engineer.

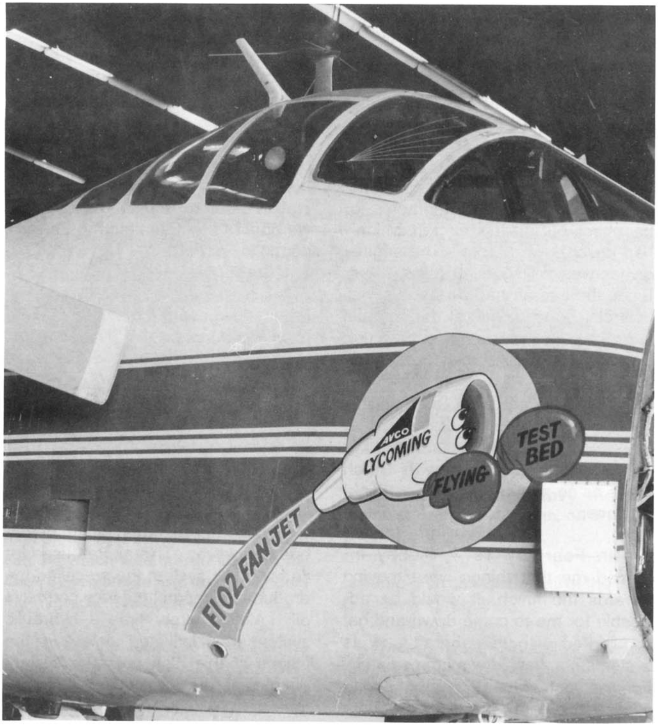
"In February 1971, Hobby informed me that things were moving towards the finish. It would be advisable for me to come down and get acquainted with the aircraft and its systems. I flew down immediately. For the last several months, I had studied the pilot's handbook. Time had arrived to put my hands on the actual hardware. But I soon realized that Hobby was too optimistic in his judgement concerning the date the aircraft would be ready to fly to Stratford. I found too many operating intermittences of the various controls. Even the engines did not perform as well as I would have liked. Every system seemed to operate in a very erratic manner. Whenever one problem had successfully been fixed, another item was found that did not work satisfactorily. Hobby, Sweet and Alwa worked practically day and night trying to do their very best. Time was no longer on our side, the aircraft had to be brought to Stratford as soon as possible so that Bill O'Connor with his group could put their hands on the actual hardware. All preliminary drawings based on the microfiches we had received were almost completed. Design Engineering did not dare to order hardware for the modification until dimension etc. could be actually checked with the aircraft. Time was of the essence.

"To certify the aircraft, we had to demonstrate to the Regional FAA office in Tucson that the aircraft was in perfect shape. We would never be able to do that. I became quite discouraged and lost confidence and all hope that we ever would get this aircraft to Stratford. Finally I had an idea: we ought to fly the aircraft on a ferry permit to Stratford. We had more men and better resources available at Stratford to bring the aircraft up to the required standard and at the same time Bill O'Connor and his men would have access to the aircraft to proceed with their work. The aircraft could then be licensed by our Regional FAA office. I contacted the FAA authorities in Tucson and received their assurance to cooperate in whatever way possible.

"Another serious glitch developed, however. This aircraft used for its hydraulic system the so-called hydro-lube, a fireproof but very corrosive oil. Almost every time a hydraulic system was activated, a leak in the fittings of this high pressure system developed. It was not difficult to estimate that at this rate of consumption the few gallons of hydraulic oil we received with the aircraft would soon be depleted. The way things were going we would have needed a considerable quantity of that stuff. Very soon we discovered that because of its corrosive nature, hydro-lube was no longer used in aviation and no longer was available. We had two options: either to find more of this oil or use regular hydraulic aircraft oil, in which case all of the seals in the hydraulic systems would have to be changed. They were not compatible with the regular standard hydraulic oil. A change in seals would have caused a serious delay. I spent many hours on the phone until I finally found the manufacturer of hydro-lube. I was told that this material is only made once a year in a big quantity for one customer, an electric power station. They were right now in the process of making hydro-lube for that company and if I wanted to have some, I ought to contact that company to increase their order for our requirements. The Manager of that Electric Power Station agreed immediately to help us and increased his order by two hundred gallons. A big load fell off our shoulders. That was a ray of hope on a rather difficult path and all of us continued our efforts with new vigor to get the aircraft out of Tucson. The earlier the better!

"Work progressed nicely and I thought that towards the end of March we would be ready to fly out of Tucson. I asked Butch Davis to come to join us to give him enough time to acquaint himself with the aircraft. I also informed the owner that we would soon be ready to start my check-out and I invited him to come to Tucson. Meanwhile, the FAA issued us a ferry permit for the aircraft. Based on my previous experience to fly multiengine heavy aircraft, the FAA issued me a letter of authorization to operate this aircraft in lieu of the normal license endorsement since the AJ-2 was not on the "register". Things started to look good and got better every day. Butch arrived. Collectively we studied the pilot's handbook. Together we did our cockpit drill and again and again we posed to each other questions pertaining to system emergency procedures. One day Hobby informed me that he would rather not fly in the aircraft as a Flight Engineer as it had been planned right from the beginning. That certainly created another problem. A Flight Engineer was absolutely needed in this aircraft. I simply had to look for someone else. It ought to be someone who knew the aircraft, who was willing to fly with an old aircraft with a crew not very experienced with this aircraft from Tucson to Connecticut. The most likely person around was Jack Kerns, the Supervisor of Allied Aviation. When I told Jack about our problem he immediately agreed to fly with us. I was certainly very happy and had all confidence in him.

"On about the 20th of March 1971 the previous owner arrived. He knew the aircraft and thought it unnecessary for him to go to the airport to acquaint himself anew with the cockpit. So the day finally arrived, when we were ready to fly. The previous owner was in the pilot's seat, I occupied the copilots position and Jack was at the flight engineer's station. The engine's were started and sounded very good. We taxied out to the runway and with the cockpit check completed we turned the aircraft into the wind. The tower cleared us and we rolled down the 10000 ft. long runway rapidly gaining speed. I looked at the airspeed indicator located on the left side of the instrument panel. Did I see right? The needle did not move, it stayed glued at 0 MPH. Over the intercom I alerted everyone that we had no airspeed indication. By this time we had left more than half the runway behind, with the engine at full power and still on the ground. The pilot throttled the engine back and applied brakes with all they would give n order to avoid the aircraft running off the runway. The aircraft stopped right at the very end of the runway. The aircraft stopped right at the very end of the runway, we turned onto the taxi way, stopped the aircraft and took a deep breath, that was a close one. Suddenly we heard a loud explosion and the right side of the aircraft dropped down several inches. We climbed out of the aircraft and saw smoke rising from all the tires. Obviously the pilot applied too much brakes, causing the brakes and tires to overheat. The tires on the right side obviously could not take all that heat and just exiploded. That was the end of our first trial.



Close-up of the F102 insignia on the nose of the AJ-2. Boxing gloves were brown, background and stripe after AVCO was light blue, and the exhaust was gold. (Eddy Mellina)

"It took several days to obtain new tires. Then we experienced an Arizona sandstorm which, according to the forecast, would last two days. By the time the storm ended, the check pilot had left and I had to contact the FAA to get permission to fly the aircraft. They again inspected my logbooks and based on my previous heavy aircraft flight experience, gave me authorization to fly the AJ-2 without a familiarization or check flight. We were getting ready for the big day. It was April the first, 1971. About two o'clock in the afternoon we were rolling down the runway. I felt fully in control of the aircraft. It was a beautiful take off and the aircraft climbed nicely. I took a deep breath and just wanted to make my first power reduction. We were about two hundred feet high, when suddenly all my instruments went dead. I had no idea of my propeller speed, engine temperatures or power. The only instrument working was the airspeed indicator. Jack informed me over the intercom that we had an electrical short somewhere that he could not fix while in flight. I did not ask for gear up, but declared an emergency. We all breathed with relief after having made the landing. It took a day or two to find and repair the short but then the weather deteriorated: sand storms with bad visibility and strong winds caused a long delay. Finally, on April 16, 1971, we were ready to go up again. I think we all felt more comfortable this time than at the first flight. Again take off was normal, instruments were working fine, I made my first reduction at about 300 feet my first reduction at about 300 feet height when suddenly the left engine started to backfire so badly that I had to reduce its power considerably. In accordance with normal procedure I asked Butch to get the gear up so that we could maintain our altitude with one operating engine. Again I requested and received emergency landing clearance. With the right engine at almost max. power, we could not maintain our altitude. A glance at our gear position indicator revealed that the gear was unlocked but not in the retracted position. So now we had a gear system failure on top of the engine problem. My hope was that the right engine would continue to perform and that we would be able to get the gear down to lock before landing. I asked Jack to stand by for using the emergency gear down procedure. I made a tight pattern to get on to the final approch leg, the right engine was doing well and was giving me all the power needed; we were on a short final; I asked Jack to activate the emergency gear down system, Butch was anxiously looking at the gear position indicator; there it was , the three wheel pictures, gear was down and locked. A few seconds later we contacted the ground, thankfully in one piece. Well, we had made it again. Following the repairs of the engine and gear system we made several more uneventful flights. The entire aircraft performed satisfactorily and we started to make preparation to finally fly the aircraft to Stratford. Although we had the Allison J-33 engine installed in Tucson it remained inoperative. I was afraid that once we would start to work on that engine, we would encounter more delays. I wanted to get back to Stratford as soon as possible. The manual stated very clearly that take-offs could be made with only the two recip. engines. We also were very light and so I did not see any reason to extend our stay in Tucson to get the jet operating.

"Finally, on the morning of April 21, 1971, we left Tucson for Dallas, Texas, our first refueling stop. We arrived at Dallas without any problems three-and-a-half hours later. The aircraft created, here as well as later in Nashville, a considerable amount of curiosity. Before shutting down our engines, I performed an engine check. To my dismay we noticed that we could not get our normal take-off power of 50 inches manifold pressure. The engines delivered only 40 inches with throttle wide open. My suspicion was confirmed when I later checked the operation of the wastegates. When activating the supercharger switches, the wastegates did not close on either engine, thereby failing to divert the exhaust gases over the superchargers which remained inactive. Jack checked the system but could not find the reason for the malfunction without causing a lengthy delay. Evaluating the situation among ourselves, we decided to go on with our flight.

"After refueling and eating we were ready to continue on our trip to Nashville, Tennessee, for our overnight stop. While taxiing out, Butch had his hands full to answer more incoming radio calls from pilots asking all kinds of questions about this aircraft. The run-up was normal with the exception that both engines delivered only 40" of manifold pressure, indicating that the waste gates remained open. During the pre-take-off check we still got calls about this aircraft. I asked Butch to ignore them since we had now to attend to our important functions. We got our clearance, lined up, and I opened the throttles and started to roll down the runway, both engines delivering 41 inches manifold pressure. Suddenly the manifold pressure of the left engine got up to 58 inches. I quickly throttled back to 50 inches. The airspeed increased, we soon reached 100 knots but the aircraft did not feel "light" and it felt as though the aircraft was not willing to leave the ground. Something was wrong. I scanned the instrument panel and there it was: we had forgotten to lower our flaps down to the take-off position. The constant chatter with other aircraft must have distracted us while we made our take-off check. As soon as Butch lowered the flaps, we became airborne and not too soon as we had just reached the end of the runway.

"At the Nashville weather station we received unpleasant news. For the next several days they expected rather bad weather. Lots of rain with a low cloud base starting later that night. It was too late to leave Nashville, since the FAA restricted the aircraft for day VFR operation only. We really did not like to leave the aircraft in the rain because we were afraid that the moisture could create problems to the aircraft's electrical system. Unfortunately there was no hangar big enough to accommodate the AJ-2, so we had no choice but to wait and hope for the best.

"It was raining the entire night and it was raining the following morning. Rain was forecast for the next two days. We had to get out of this weather as soon as possible. According to the forecaster once on track and 50-60 miles away from Nashville the weather should improve. We were on our way on track and the further we got away the weather got worse. The rain continued and the cloud base got lower and lower. We simply had no other choice but to climb above the clouds even though I would have to proceed on an instrument flight plan for which the aircraft was not licensed. But we had no other choice. Apparently we were too low to establish contact with a flight service station; consequently Butch tried to establish contact with any aircraft flying in this area to find out, if possible, the top of the clouds and to use it to relay our IFR clearance request. Soon a pilot returned our calls. He was flying at 12,000 feet above the clouds. He also relayed our IFR clearance request and once cleared, we increased our power and started to climb. One engine maintained climbing power of 48", while the manifold pressure of the other one, whose wastegate did not close, decreased steadily. On the way up we accumulated some ice, to no ill effect, and soon we reached the top of clouds and proceeded as cleared in beautiful sunshine. After a while the clouds below us started to disperse and we had good weather all the way to the Bridgeport Airport in Stratford.

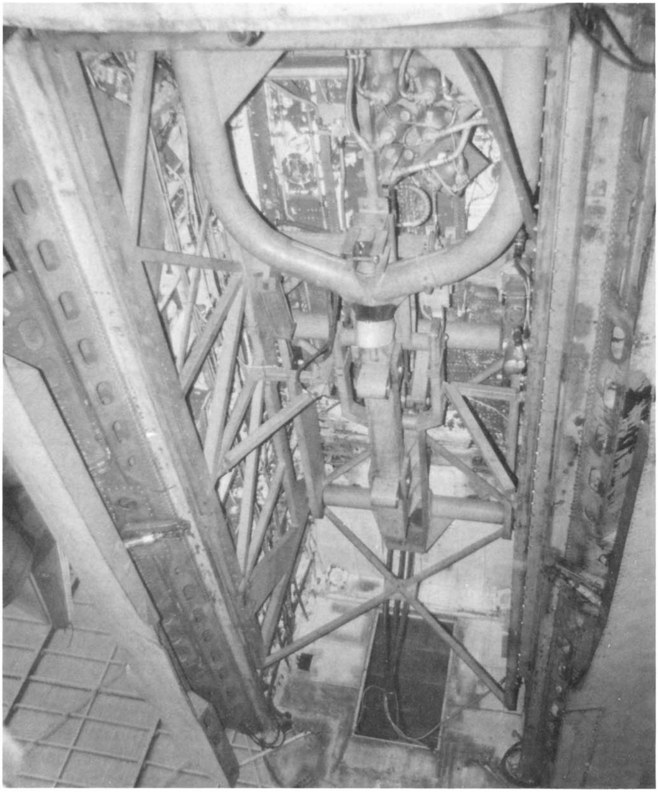
"We had a royal welcome. Most members from the Engineering Dept. were at the airport. Bill Lobdell, my supervisor, Bob Schaefer, Director of Engineering, and many others. Pictures were taken and a couple of champagne bottles were de-corked. It was a great day. Bill O'Connor and his men could finally put their fingers on 'the hardware'. No sooner was the aircraft rolled into the hangar, they were crawling and climbing all over the aircraft taking measurements, looking for bulkheads and stringers trying to find out whether their preliminary concepts could materialize.

"A very busy time followed for all concerned. Bill O'Conner continued with his designers to work on the 102 engine mounting and retraction mechanism. Engineering was busy to lay down their instrument requirements and with the design of the thrust measuring system, the instrument people were working hard to come up with an instrumentation package which would fit into the rather confined space of the cockpit between the pilot's seat and the flight engineer's station. We, in flight test, gave the aircraft a complete check out. All components were checked and we got busy to modify this aircraft's fuel system. It has three fuel tanks. One in each wing and one in the shoulder. The latter had to be isolated from the original aircraft fuel system to hold JP-4 fuel needed for the test engine and new hoses had to be installed from that tank down to the test engine. Both wing tanks would hold regular aircraft gasoline to supply fuel to the two R.2800 engines and to the Allison J-33 jet engine which, with an adjustment on its fuel control, could operate on this fuel. According to the manual the R-2800 engines needed the high octane, violet colored 115/145 fuel. We had no trouble to obtain this fuel in Tucson, Dallas and Nashville, but our fuel supplier in Bridgeport informed us that this fuel was being phased out and replaced by the 100 octane low lead fuel. Obviously this news was a shocker to us. We immediately contacted Pratt and Whitney, here in Hartford, for advice. They promised to investigate. After several days, they informed us that the R-2800 could operate on the 100 octane but advised us not to increase the manifold pressure above 58".

"We also replaced the old turbine wheel in the J-33 engine with the very much improved new 'hard' wheel. We simply did not want to have any problems with this engine since we would need its thrust to get the fully loaded AJ-2 off the ground on the short runway. It was a race against time. As mentioned before, we were contractually obliged to start the flight test program not later than the last day of January 1972.

"Because such an important program could not depend on the availability of one pilot alone, Butch Davis was trained as my backup. Whenever we could free the aircraft from maintenance, I flew with Butch. Butch would sit in the pilot's seat and I would occupy the right seat which didn't have flight controls. I would talk Butch through take-offs, landings, stalls, and simulated single engine landings. He was trained in short order.

"To meet the target date, all of us worked literally day and night. It was an exercise in coordination of all departments concerned. The engine had to be instrumented, data recording system installed, and engine control cables had to be interfaced at the pressurized firewall behind the cockpit. The extension/retraction system for the F-102 engine had to be checked outside the aircraft, then installed and finally checked in flight.



Extension mechanism installed in the bomb bay of the AJ-2. (Eddy Mellina)

"Some engineers were concerned about how the test engine would affect the controlability of the aircraft once deployed into the airstream. In order to test this aspect, the frontal drag area of the engine was calculated and a plate representing this area was attached to the deployment mechanism. Finally, on 10 January 1972, we made the first flight with all the required test equipment and the drag plate installed. Rudy Opitz was the copilot/test engineer for this first important flight. At an altitude of 5,000 feet, Rudy activated the hydraulic extension mechanism with the drag plate attached to it. The green light (up and locked) changed to yellow (in transit) and after several seconds the red light showed (down and locked). We did not feel the slightest affect on the aircraft's attitude or controlability. Following this successful flight, all hands were back at work with renewed enthusiasm to finish all the work still neccessary. Finally the test engine was attached to the extension mechanism, instrumentation was hooked up and we were ready to get the actual test program on its way.

"At this point, the function of the copilot should be explained in more detail: Besides performing the normal minimal functions of a copilot, raising and lower the gear, he also performed the function of test engineer. The instrument panel in front of him contained all of the F-102 engine instruments. On the right console was the power lever for that engine and the controls for the extension and data recording systems.

"On 31 January 1972 at 15:30 hours, right on our contractual target date, we were finally ready to make our first real test flight, with all systems ready to operate as designed, and in perfect working order. We had made it!

"Because of the large diameter fan shroud of the F-102 engine and because of the space required by the extension mechanism within the bomb bay, it was impossible to retract the engine completely into the bomb bay. However, once in flight and after extending the F-102 engine, the bomb bay doors could be closed. When the aircraft was on the ground, with the F-102 retracted, the clearance between the ground and the fan shroud of this engine was about one foot. Consequently, it was always very important to assure that the main landing gear struts were always extended to their maximum permissible height so as not to damage the F-102 engine during a hard landing.

"All our takeoffs were made with the assistance of the J33 engine. We would make our R-2800 run-up at the takeoff area, perform our pre-takeoff cockpit check and request takeoff clearance. The tower was briefed in advance of our procedure - that once cleared, we would roll into position and hold for about 20 to 30 seconds during which time we would start the J33 jet and open it up to 100 percent compressor speed, then power to the R-2800 engines was applied. Normal takeoff power was 58 inches of manifold pressure. Once an airspeed of 100 knots was obtained a slight back pressure on the stick lifted the aircraft off the ground. We used the last minute jet starting procedure bacause of its high fuel (AV-GAS) consumption. Once safely airborne, the gear and flaps were retracted. At about 1,000 feet the jet would be shut down and the power on the R-2800s was reduced to a climb power setting of 48 inches with the mixture set to auto-lean. This manifold pressure was automatically maintained until we leveled off once the test altitude was reached. At this point power was varied and adjusted to the required test speed.

"Our test flights were performed at various altitudes, anywhere between 15,000 and 30,000 feet and at various speeds between stall and Mach.8. Very often we used the F102 to assist us in reaching our test altitude. The thrust of this engine would really boost our rate of climb considerably.

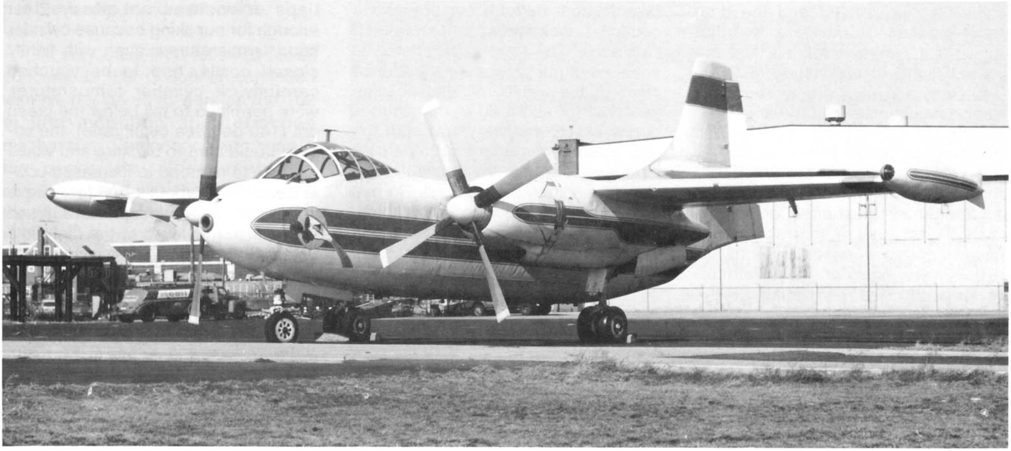
"Unfortunately, the cockpit pressurization did not work well. At 30,000 feet the cockpit altitude was a miserable 23 to 25,000 feet. None of us felt very comfortable at that altitude, as wearing oxygen masks in itself is very unpleasant. This was that much more aggravated because of the required oxygen pressure breathing. This created a real difficulty to communicate with the control center because the microphone was built into the oxygen mask, which made it very difficult to talk with oxygen being forced down your throat. The R-2800s did not like this altitude either and were often backfiring. The high tension ignition system was the cause of this problem, so a low voltage ignition system was installed in its place.

"Once a test run was completed, we tried to reduce altitude as quickly as possible, if for no other reason than to remove the oxygen masks from our faces. The descent, with gear and flaps down, was not always fast enough for our liking because cylinder head temperatures, even with tightly closed cowls, had to be watched carefully. If cylinder temperatures were permitted to fall below the green arc (140 degrees centigrade), the engine would start to backfire and would hesitate to respond to increased power demand. At about 1,500 feet above the airport we would light the J33 and keep its power lever at the flight idle detent. This was a safety measure to assure enough engine power, should we have a go-around or should an R-2800 fail. The landing speed was 110 knots which was very difficult to maintain. Once over the fence when an early touch-down was assured, the jet would be shut down and a very smooth touch-down could be made.

"In July 1972 we completed our flight test program for the Lycoming F102 engine and the AJ-2 was idled until January 1979 when a new test program started. The new program was to verify the calculated performance characteristics of the ALF-502 turbofan engine destined to be used in commercial aviation. This engine was actually a modified and upgraded version of the F102 turbofan, which we had tested previously. This program was completed by December 1980 with a total of 45 hours of flight test time.

"Near the end of the test program, one of the R-2800 engines failed in the traffic pattern on the downwind leg prior to landing. This happened before the J33 was lit up. The pilot hadn't followed our procedure of starting the jet before entering the traffic pattern, and now he was in trouble. With the gear down, bomb doors open, and the test engine partially protruding out of the bomb bay, the drag was too great for one engine to maintain altitude and airspeed. The pilot had to wait for about 25 to 30 seconds for the engine to wind up to flight idle speed, before he could open the throttle without burning the turbine. Although he was pushed for time, the pilot managed to activate the jet, get its power up and make a successful landing. A spare engine was installed within three days and our test activity was resumed.

"After completing this test program, the future of our AJ became uncertain. We kept it in our hangar

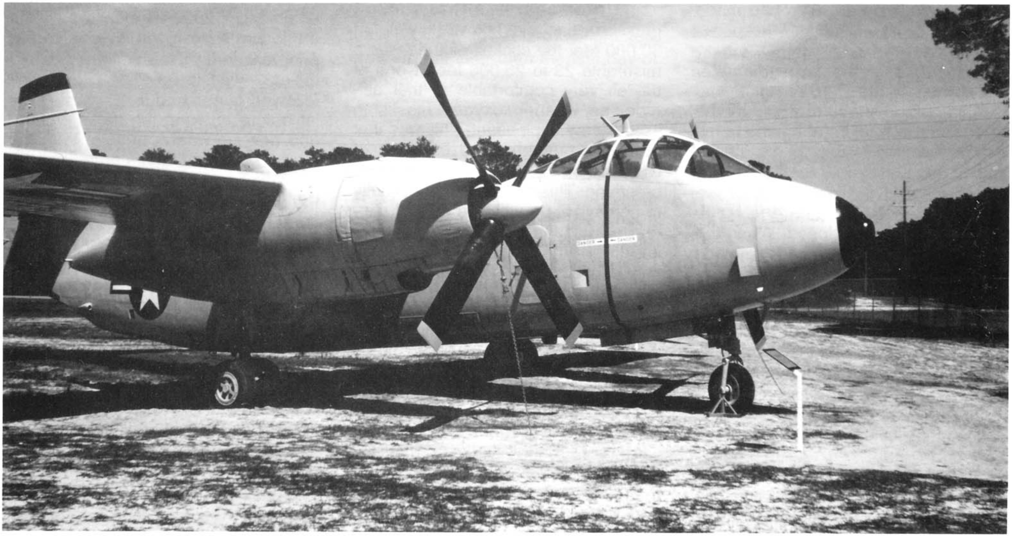


and maintained it for another four years, hoping that this aircraft would again be needed one day for another test series. We had started to run out of some of the "black boxes" used for the automatic control of some of the systems. Replacing these boxes required lots of improvisation from our aircraft electricians. One day an alert mechanic discovered several lose rivets on the wing attachment spar. X-rays showed considerable areas where the skin layers had started to separate from the spar. A repair of such magnitude was considered to be uneconomical and so, one day, the decision was made: the AJ-2, the only one of its breed still in existence, was to be delivered to its appropriate final resting place, the Naval Aviation Museum at NAS Pensacola, Florida.

"On 9 May 1984, I flew our AJ-2 N68667, via a refueling stop at Robbins AFB, to NAS Pensacola, Florida. The AJ-2 handled beautifully, responding to control input smoothly and without delay. It was equally a beautiful and sad day as I loved to fly the old Savage.

Avco Lycoming AJ-2 N68667 awaits its next mission. (Hildreth via Eddy Mellina)

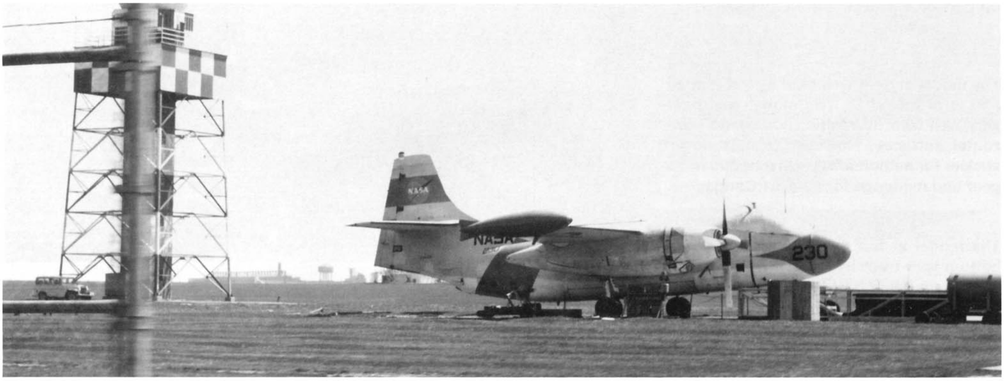
N68667 at NAS Pensacola, Florida, after being repainted in grey and white Navy schemes. (Bob Stollof)

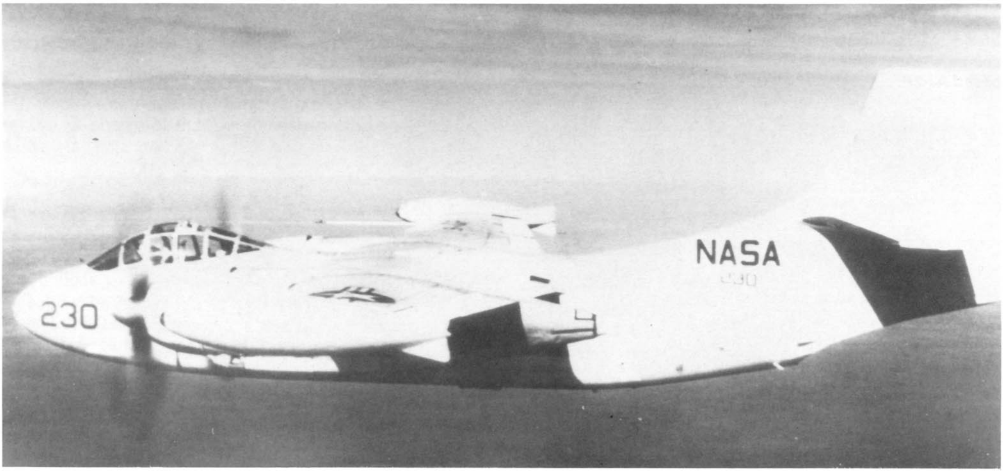


NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, NASA

The National Aeronautics and Space Administration or NASA needed to find an aircraft which could be used as weightlessness simulator for the early Space program's fledgling Astronauts. They settled on the AJ-2 Savage because the price was right, it could reach the necessary altitude, and its bomb bay was large enough to accommodate the test. Three AJ-2s were bailed to NASA for the program and were used from January 1960 through September 1964. The aircraft were put in outdoor storage for a number of years and then turned over to the airport fire brigade and burnt up during fire fighting demonstrations.

Below, NASA AJ-2 134069 in outdoor storage on 29 April 1965 at Columbus, Ohio. The aircraft was standard Navy grey and white with blue tip tanks. The nose, fuselage, and tail stripe are believed to be red/orange. Bottom, 134069 (NASA #230) during its testing days with grey and white tip tanks. Other markings are washed out in this NASA photo.

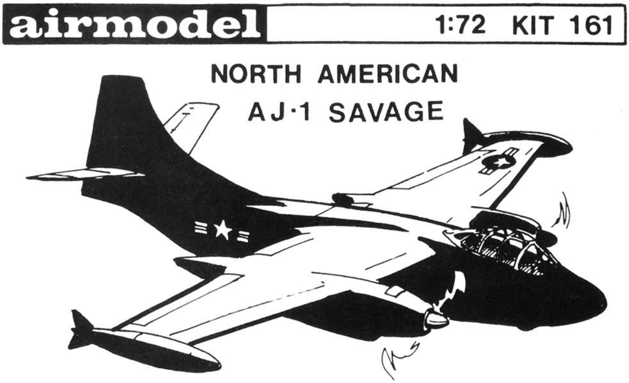




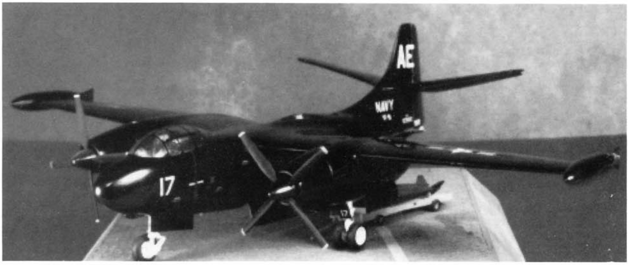
THE SAVAGE IN PLASTIC

THE AIRMODEL KIT BY TOMMY THOMASON

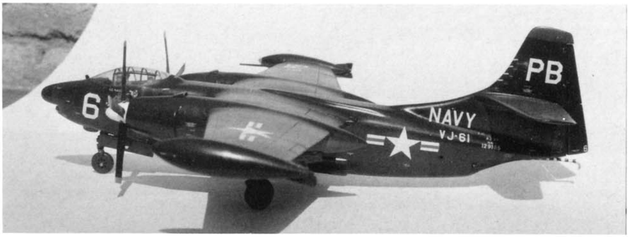
The 1/72 scale Airmodel (kit 161) vacuform kit is a crude but reasonable approximation of the early AJ-1 Savage. It provides only the basic structure of a model; there is no landing gear, propellers, cockpit, decals, etc. The shape is vague in some areas like the upper surface of the wings. The fuselage and nacelles are a bit undersized and the wing is too thick which sort of compensates for the nacelle not being deep enough. The hump for the jet intake is missing entirely and the cabin door is on the wrong side and too far forward. It is a start , however, and at the time I bought it only $5.95 and the only kit available.

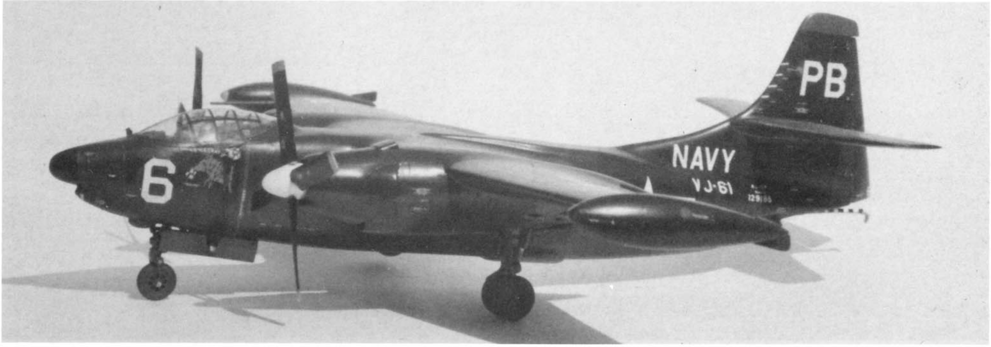


The model at right was built by Pat Purcell and is of an AJ-1. The model was built very well with moveable rudder and horizontal surfaces. However , he is not a stickler for authenticity with a bogus nose gear and markings for a VF-91 Cougar.

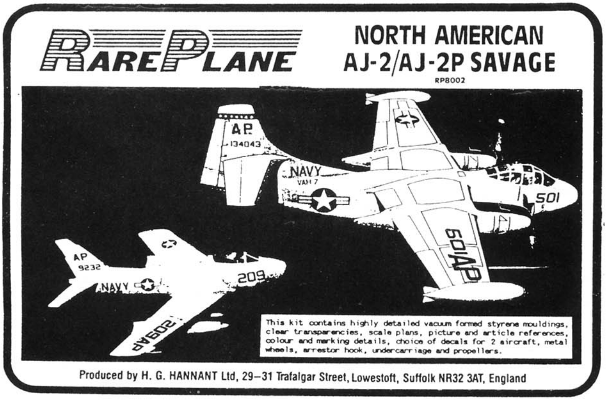


The model at the lower right and at the bottom was built by Vince Fleming and depicts an AJ-2P of VJ-61. See page 65 for close-up photos of this aircraft and its nose art, the "Mean Hairy Hog". A lot of work went into modifying this rudimentary kit into an AJ-2P. Scratchbuilt landing gear made from tubing was used, the tail section was modified, and the photo nose was also scratchbuilt, as well as the prop blades. The fin tip was red and the spinners were white on this Philippine-based AJ-2P.





THE RARE PLANE AJ-2/AJ-2P SAVAGE IN 1/72 SCALE



RarePlane

NORTH AMERICAN AJ-2/AJ-2P SAVAGE

RP8002

This kit contains highly detailed vacuum formed styrene mouldings, clear transparencies, scale plans, picture and article references, colour and marking details, choice of decals for 2 aircraft, metal wheels, arrestor hook, undercarriage and propellers.

Produced by H. G. HANNANT Ltd, 29–31 Trafalgar Street, Lowestoft, Suffolk NR32 3AT, England

The Rare Plane kit is a very nice offering for a large vacuform kit. The kit is molded on one large vacuform sheet, and has relatively accurate panel lines. The fuselage is molded with the AJ-2P nose and with camera port locations. A separate nose is provided for the AJ-2 and can be grafted into place after the 2P nose is cut off. You would also have to sand off the camera locations in the belly to build an AJ-2.

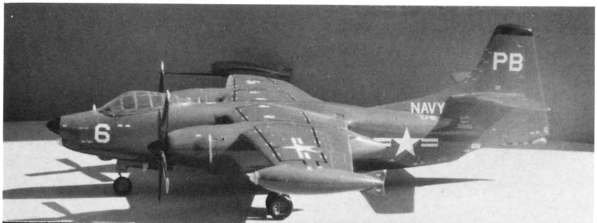
The kit gives you two vacuform canopies to guard against mistakes. Both canopies are for the AJ-2 and late AJ-2P, but have the center canopy frame extend through the last (aft) canopy section. Most published photos appear to show the canopy this way because the escape panel, which has the frame, is usually in the open position which puts that frame beneath the last (aft) canopy section.

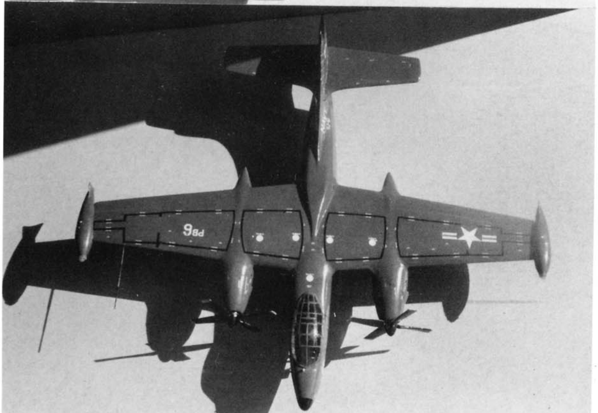
White metal parts consist of props, spinners, landing gear, tires, tail hook, and blade antennae.

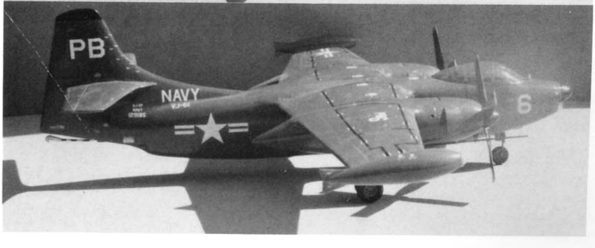
Good drawings which show the decal locations are provided along with excellent decals for a grey and white VAH-7 AJ-2 Savage (134043) and a VJ-61 AJ-2P Photo Savage (130423).

A minor correction (which I forgot to do on the kit shown at right) is to reshape the vertical tail tip.

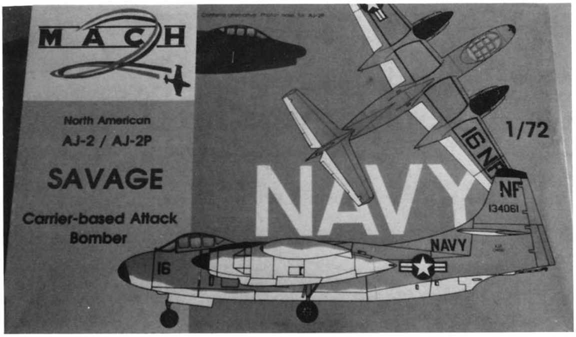
When building this kit, the one piece wing makes for a smooth fit with very little filling needed. Also, don't forget to use a lot of lead in the nose to keep the gear on the ground. If you choose the photo bird you will be very pleased with the results once all the colorful stenciling is added. This kit was a lot of fun to build and relatively easy for such a large vacuform model. Even if this would be your first attempt at a vacuform model, I would greatly recommend this kit. My kit was purchased from Brookhurst Hobbies in Fountain Valley, California.



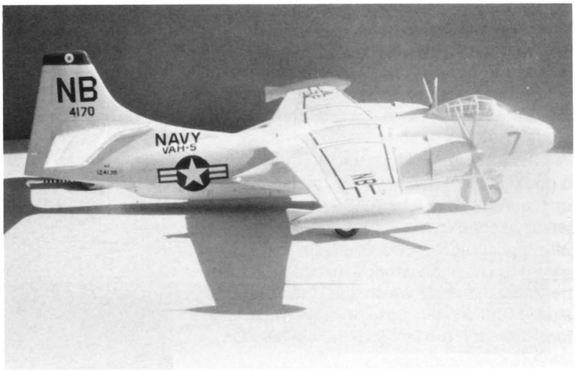




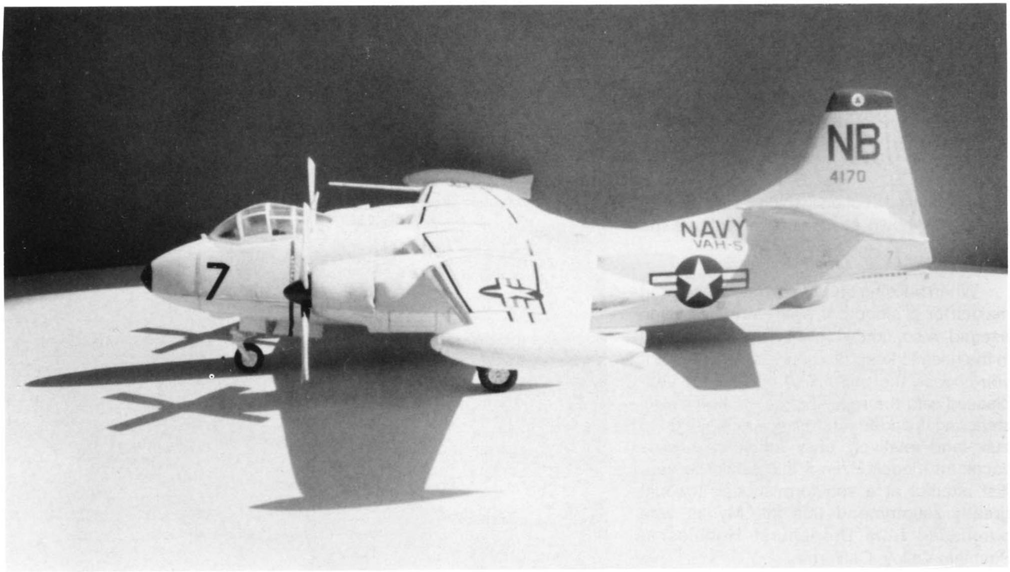
THE MACH TWO AJ-2/AJ-2P SAVAGE IN 1/72 SCALE

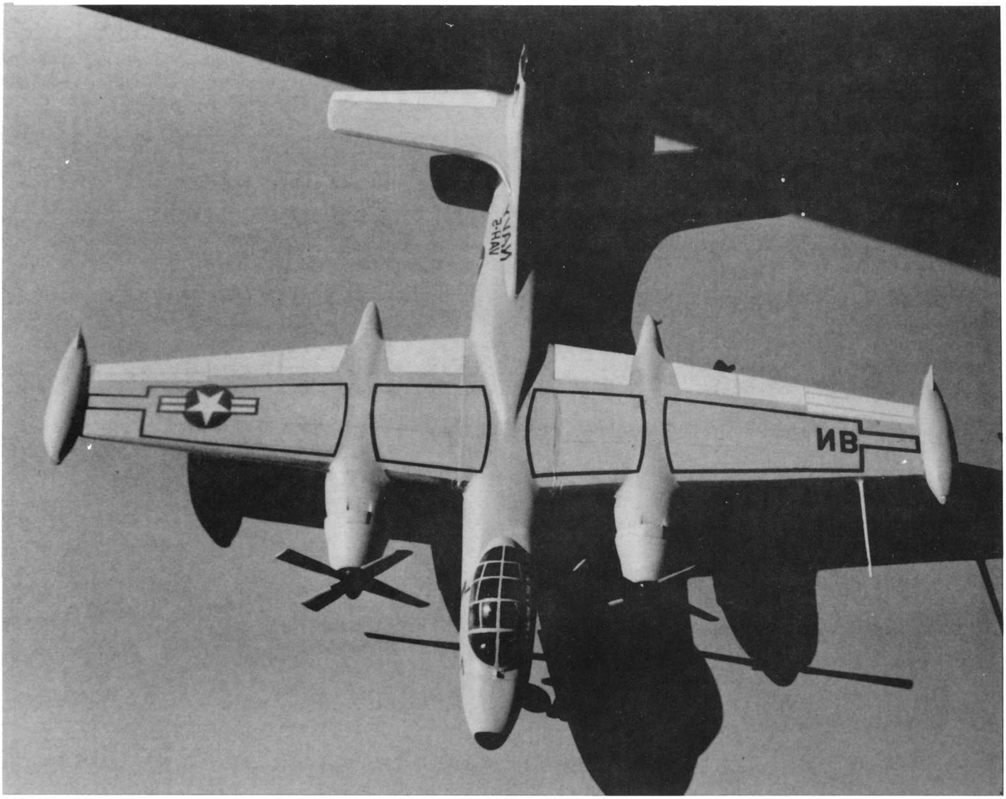


The Mach Two kit is injection molded and imported from France. The kit does not really depict an AJ-2 or AJ-2P, but most closely an AJ-1 with a retrofitted tail group. This is because the kit's canopy crudely depicts an AJ-1 or early AJ-2P canopy and the kit comes with an AJ-1 style single piece nose gear door, which was not used on either the AJ-2 or the AJ-2P. Of course both of these errors could easily be corrected, but I built up my kit as AJ-1 124170 of VC-5 "Savage Sons". It appears that incorrect drawings were the cause of these errors as the fin tip is also inaccurate and must be cut down to the correct shape and the rudder extends too far aft at the bottom, which cannot be corrected without major surgery. Other problems are: flash, soft plastic, poor fit, crude decals for only an AJ-2, virtually non-existent directions, and incorrect shape of the fuselage door.



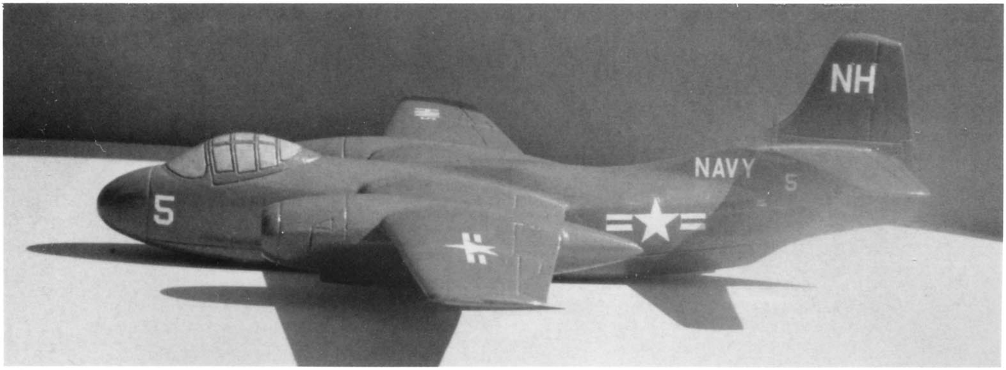
This was a hard kit to build and I enjoyed the Rare Planes kit better, after all it's 1/3 the price of the Mach Two kit. My model was built by using a combination of the Rare Planes decals and decals from the parts box. I still thank Mach Two for producing this kit and would only ask that they do better research and improve their molds.





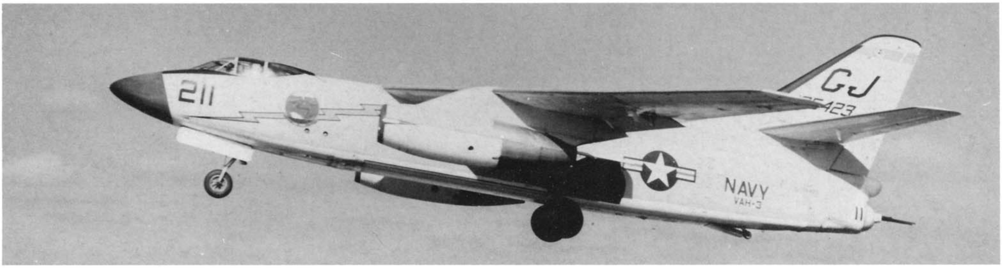
1/100 SCALE RESIN SAVAGE BY RICK'S MODELS

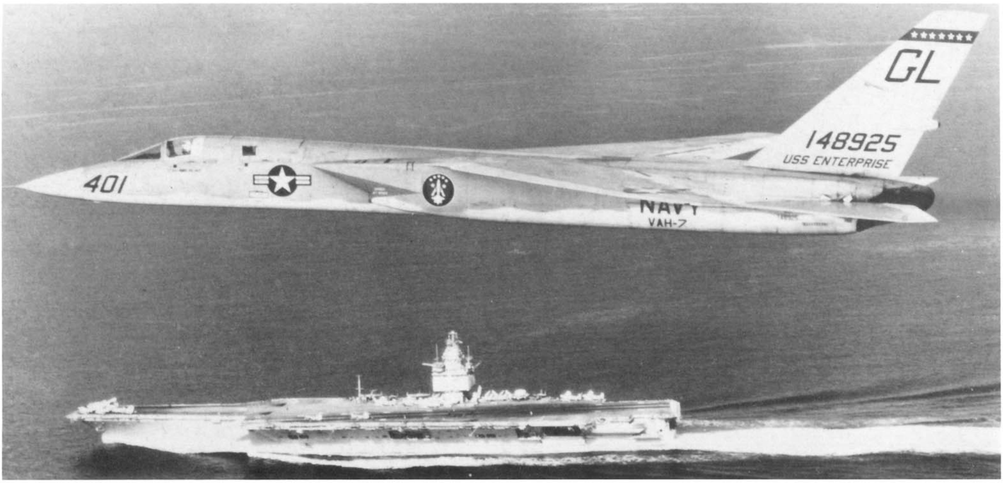
This model came in five pieces of solid cast polyurethane which included tip tanks (not shown) and metal props (not shown). No decals were included in the kit.

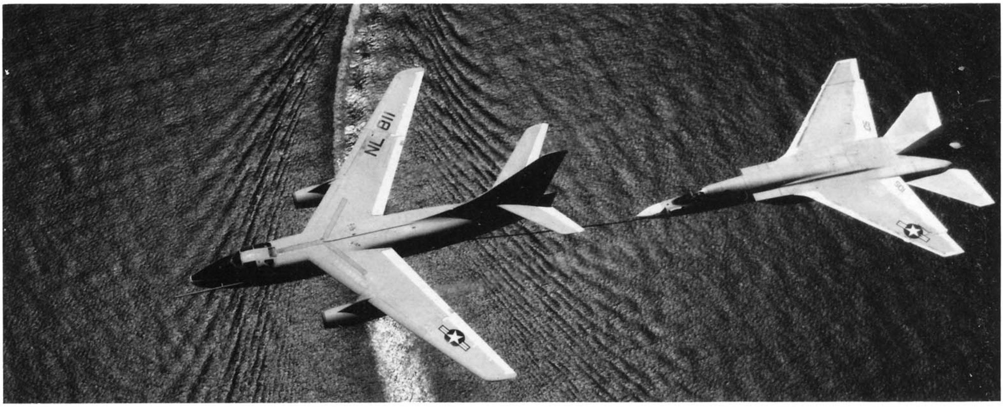


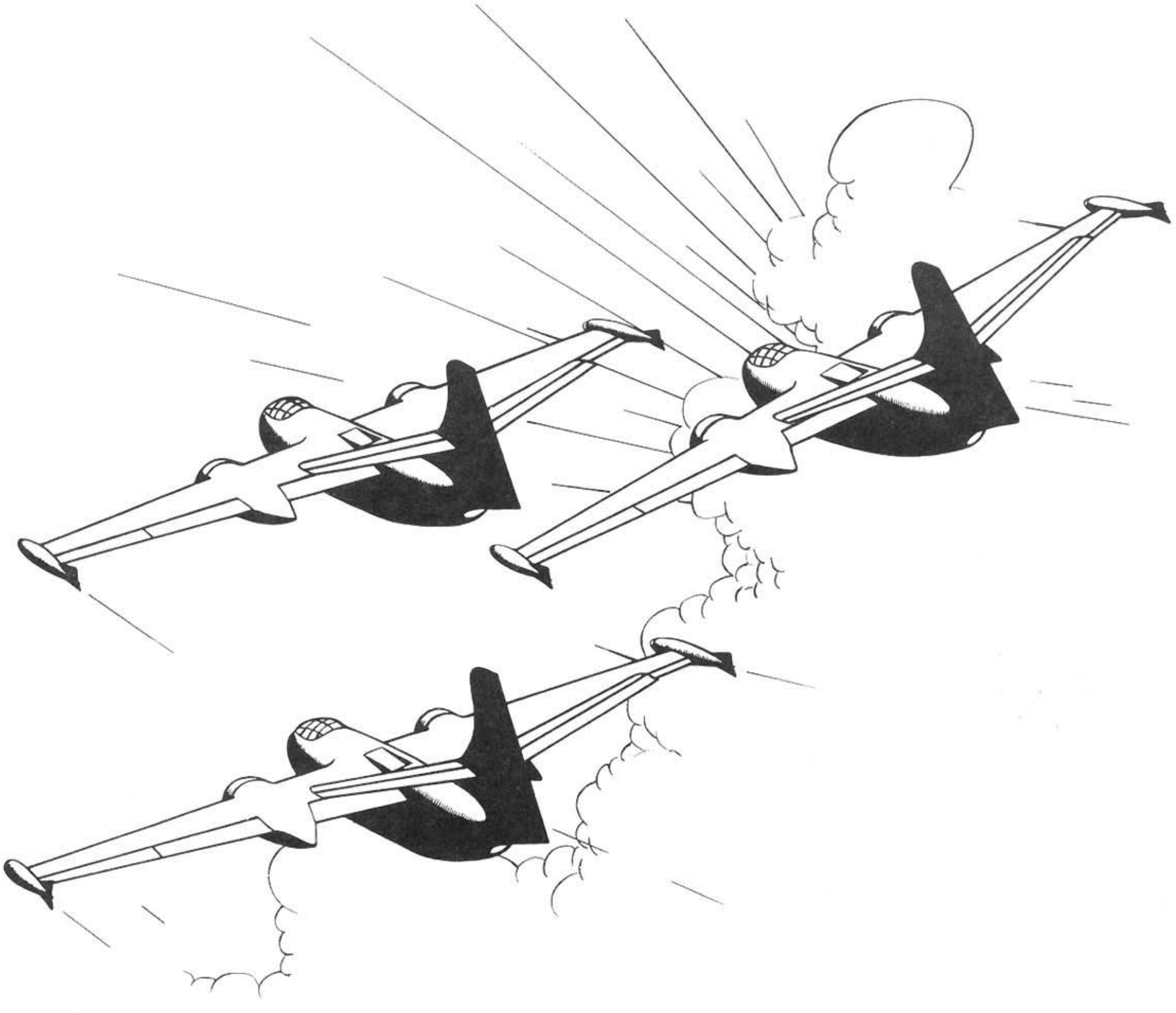
SAVAGE REPLACEMENTS, THE A3D AND THE A-5A/RA-5C

The Savage was replaced by the A3D Skywarrior as illustrated below, as an A3D-1 from VAH-3 takes-off. (Harry Gann) Middle photo shows an A-5A Vigilante from VAH-7. The A-5A was meant to replace the A3D, but was modified instead into a specialized photo aircraft known as the RA-5C. Bottom photo shows an A3D refueling an RA-5C in 1964. (USN via Swisher)









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